

*Apex*TM

Action PrinterTM L-750

by **EPSON®**

User's Manual

IMPORTANT SAFETY INSTRUCTIONS

1. Read all of these instructions and save them for later reference.
2. Follow all warnings and instructions marked on the product.
3. Unplug this product from the wall outlet before cleaning. Do not use liquid cleaners or aerosol cleaners. Use a damp cloth for cleaning.
4. Do not use this product near water.
5. Do not place this product on an unstable cart, stand, or table. The product may fall, causing serious damage to the product.
6. Slots and openings in the cabinet and the back or bottom are provided for ventilation; to ensure reliable operation of the product and to protect it from overheating, these openings must not be blocked or covered. The openings should never be blocked by placing the product on a bed, sofa, rug, or other similar surface. This product should never be placed near or over a radiator or heat register. This product should not be placed in a built-in installation unless proper ventilation is provided.
7. This product should be operated from the type of power source indicated on the marking label. If you are not sure of the type of power available, consult your dealer or local power company.
8. This product is equipped with a 3-wire grounding type plug, a plug having a third (grounding) pin. This plug will only fit into a grounding-type power outlet. This is a safety feature. If you are unable to insert the plug into the outlet, contact your electrician to replace your obsolete outlet. Do not defeat the purpose of the grounding-type plug.
9. Do not locate this product where the cord will be walked on.

10. If an extension cord is used with this product, make sure that the total of the ampere ratings on the products plugged into the extension cord do not exceed the extension cord ampere rating. Also, make sure that the total of all products plugged into the wall outlet does not exceed 15 amperes.
11. Never push objects of any kind into this product through cabinet slots as they may touch dangerous voltage points or short out parts that could result in a risk of fire or electric shock. Never spill liquid of any kind on the product.
12. Except as specifically explained in the Users Manual, do not attempt to service this product yourself. Opening or removing those covers that are marked "Do Not Remove" may expose you to dangerous voltage points or other risks. Refer all servicing in those compartments to service personnel.
13. Unplug this product from the wall outlet and refer servicing to qualified service personnel under the following conditions:
 - A. When the power cord or plug is damaged or frayed.
 - B. If liquid has been spilled into the product.
 - C. If the product has been exposed to rain or water
 - D. If the product does not operate normally when the operating instructions are followed. Adjust only those controls that are covered by the operating instructions since improper adjustment of other controls may result in damage and will often require extensive work by a qualified technician to restore the product to normal operation.
 - E. If the product has been dropped or the cabinet has been damaged.
 - F. If the product exhibits a distinct change in performance, indicating a need for service.

Where to Get Help

Customer support and service for Epson products are provided by a network of authorized Epson dealers and service centers throughout the United States. Epson America provides product information and toll-free support to its dealers and service centers.

Epson is confident that this policy will provide you with the assistance you need. For service center and technical support referrals, please call our Consumer Information number:

1-800-922-8911.

Options and Supplies

To locate or purchase ActionPrinter™ accessories or supplies, please call 1-800-873-7766.

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Introduction

The ActionPrinter™ **L-750** is an advanced **24-pin impact** dot **matrix** printer combining a compact design and high performance with a wide range of features.

Features

In addition to the high-quality printing and ease of operation you have come to expect from Epson printers, your printer offers the following:

- Draft mode with fast printing of up to 216 characters per second in 12 pitch (12 characters per inch).
- Two built-in Letter Quality fonts (Roman and Sans Serif) for producing high-quality documents.
- A convenient control panel design that allows for direct selection of fonts.
- Fourteen international character sets, a legal set, italics, and the Epson Extended Graphics set.
- Easy paper handling, featuring automatic single-sheet loading.
- Compatibility with the Epson ESC/P® commands used by other Epson Letter Quality printers.

About This Guide

This user's guide provides fully illustrated, step-by-step instructions for setting up and operating your printer.

Finding your way around

- Chapter 1 contains information on unpacking, setting up, testing, and connecting the printer. Be sure to read and follow the instructions in this chapter first.
- Chapters 2 and 3 include important information on paper handling and general printer operation. This information is necessary for the day-to-day operation of your printer.
- Other chapters contain information on **general maintenance**, specifications, and printer commands. There is also a glossary of printer terms and an index. At the back of this guide is a Quick Reference card.

Conventions used in this guide



WARNINGS: must be followed carefully to avoid damage to your printer and computer.



CAUTIONS: should be followed carefully to ensure that your printer operates correctly.

Notes: contain important information and useful tips on the operation of your printer.

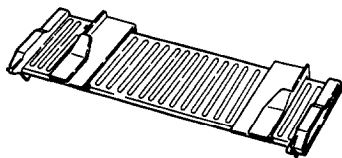
Chapter 1

Setting Up the Printer

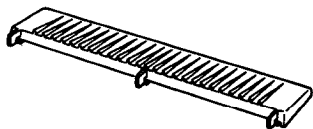
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Unpacking the Printer

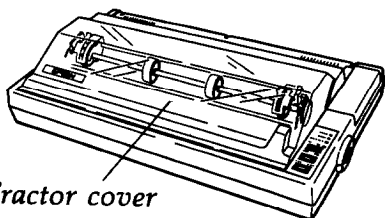
As you unpack the printer, check that you have all the parts shown below and that none have been damaged during transportation.



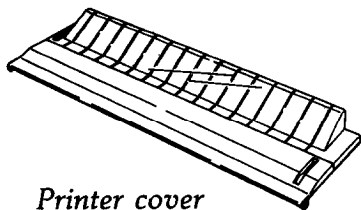
Paper guide



Paper rest



Tractor cover

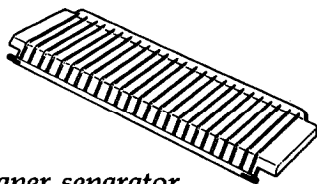


Printer cover

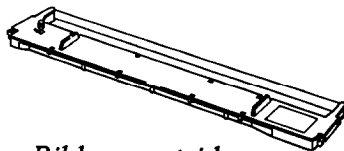
Printer



Paper feed knob



Paper separator



Ribbon cartridge

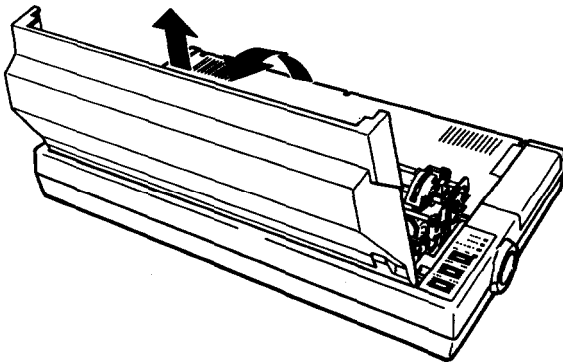
Note: You'll find the paper feed knob in a piece of the foam packing.

After removing the parts, store the packaging materials in case you ever need to transport your printer.

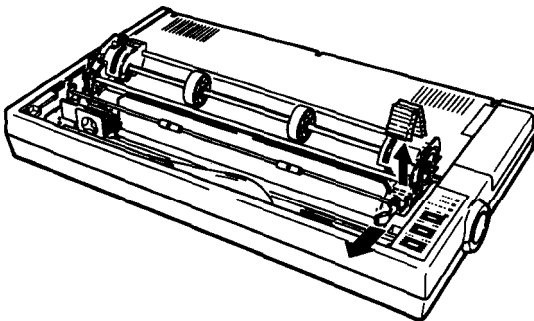
Removing the protective materials

The printer is protected during shipping by the platen protector, two locking tabs, the carriage protector, and the print head protector. These protective items must be removed before you turn on the printer. After removing these items, store them with the other packaging materials.

1. Raise the tractor cover to the upright position. Then lift the cover up and off.

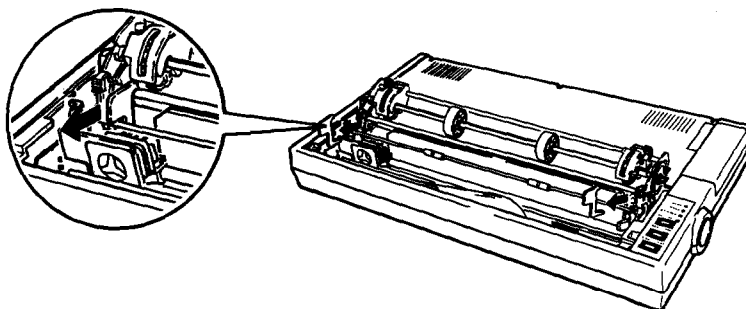


2. Pull the paper bail lever toward you; then remove the platen protector.

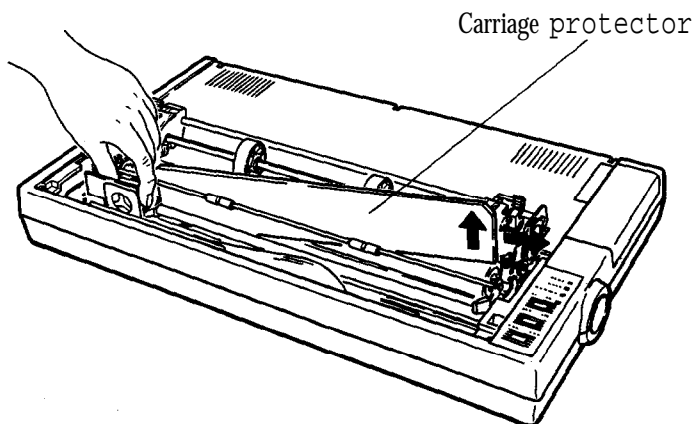


Unpacking the Printer

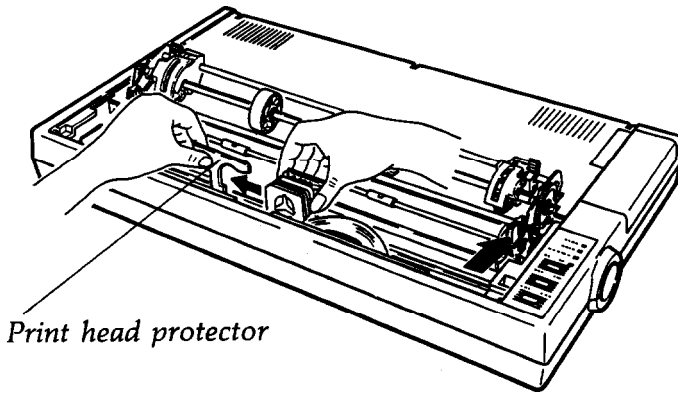
3. Remove the left and right locking tabs.



4. Holding the print head in place at the left of the printer, remove the carriage protector as shown below.



5. Push the paper bail lever back. Then slide the print head to the middle of the printer. Hold the print head in place and remove the print head protector.

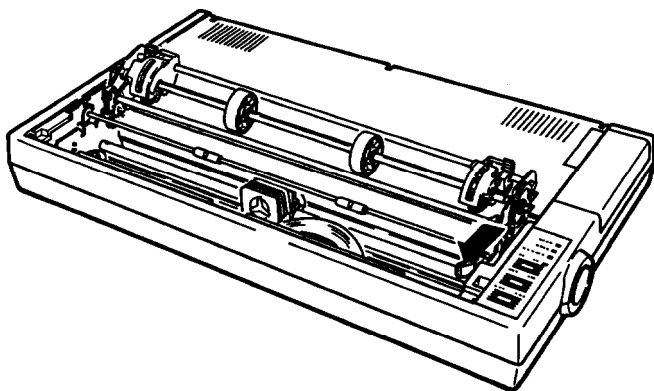


WARNING: Be sure to remove all protective materials before you turn on the printer.

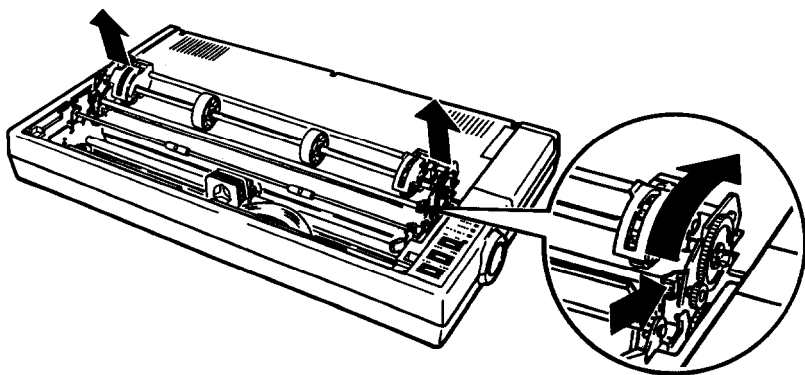
Removing the pull tractor

By removing the pull tractor now, you will be prepared to perform the printer's self test later. Follow these steps to remove the pull tractor. Make sure that the printer is turned off.

1. With the tractor cover off, pull the paper bail lever toward you.



2. Press the tabs on the pull tractor. Then tilt the tractor back and lift it off the printer.

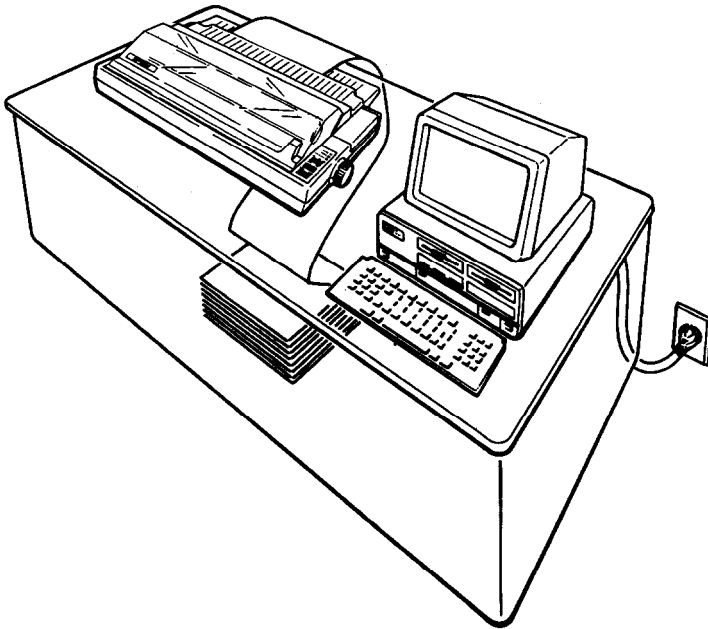


Choosing a Place for the Printer

When you select a location for your printer, keep the following in mind:

- Place the printer on a flat, stable surface.
- Place the printer close enough to the computer for its cable to reach.
- Leave adequate room around the printer to allow for easy operation and maintenance.
- Use a grounded outlet; do **not** use an adapter plug.

The illustration below shows a good printer location.



Note: If you plan to use a printer stand, make sure it meets the following requirements:

- The stand must support at least **35 lb** or **16 kg** (twice the weight of the printer).
- The stand must not tilt **the** printer more than **15** degrees from horizontal. With a cut sheet feeder, the stand must keep the printer level.
- If the paper supply is below the printer stand, make sure that the paper cannot catch on the underside of the stand or on the stand supports.
- Make sure that the power cord and the interface cable do not interfere with paper feeding. If possible, secure them to a printer stand support.



WARNING:

- Avoid locations that are subject to direct sunlight, excessive heat, moisture, or dust.
- Avoid using electrical outlets that are controlled by wall switches or automatic timers. Accidental disruption of power can wipe out information both in your computer's memory and in your printer's memory.
- Avoid using outlets on the same circuit with large motors or other appliances that might disturb the power supply.
- Keep the entire computer system away from potential sources of interference such as loudspeakers or the base units of cordless telephones.

Assembling the Printer

To assemble the printer, you need only do the following:

- Install the paper feed knob.
- Install the ribbon cartridge.
- Attach the paper guide.

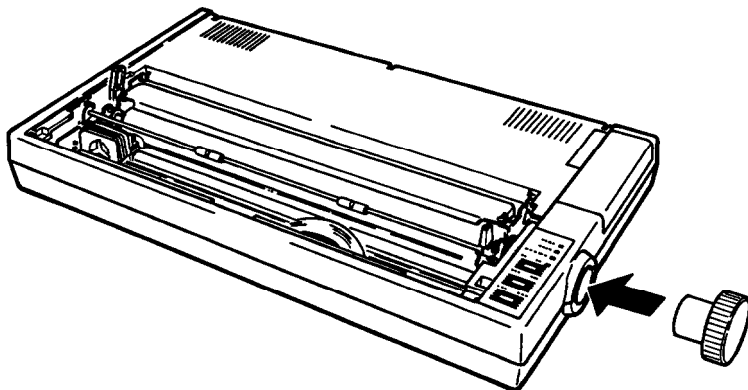
Installing the paper feed knob

The first step in setting up the printer is to install the paper feed knob. You use this knob to manually feed paper in the printer when the printer is turned off.

You'll find the paper feed knob packed in an indentation in the white foam packing material.

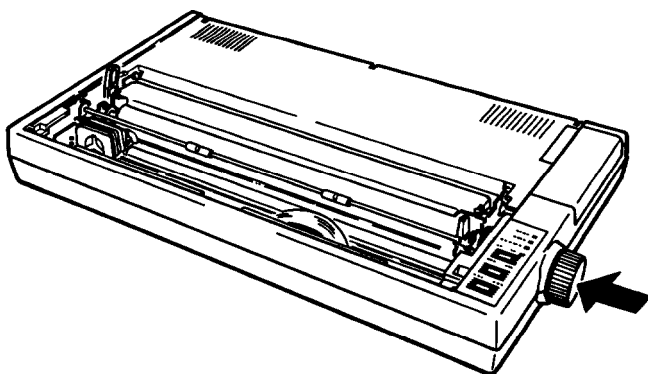


1. Insert the knob into the hole on the printer's side and rotate it until it slips onto the shaft.



Assembling the Printer

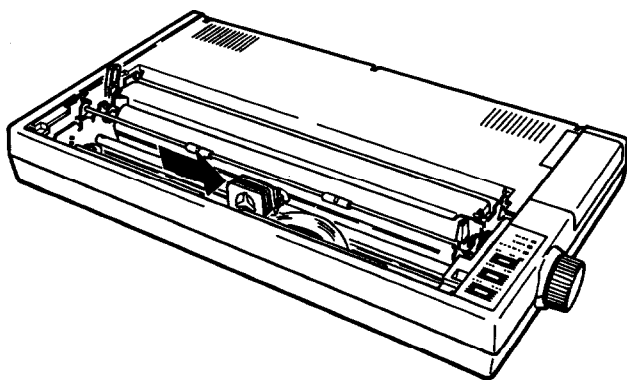
2. Push firmly on the knob until it fits against the printer case.



Installing the ribbon cartridge

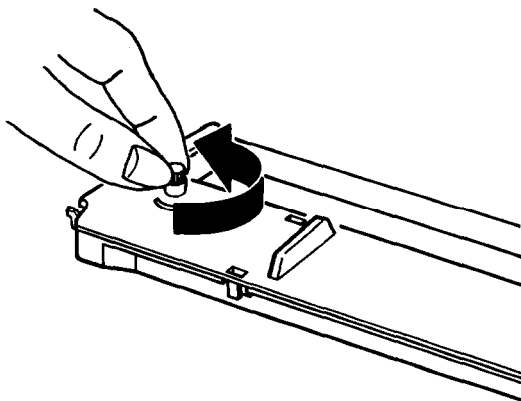
Follow these steps to install the ribbon cartridge:

1. Slide the print head to the middle of the printer.

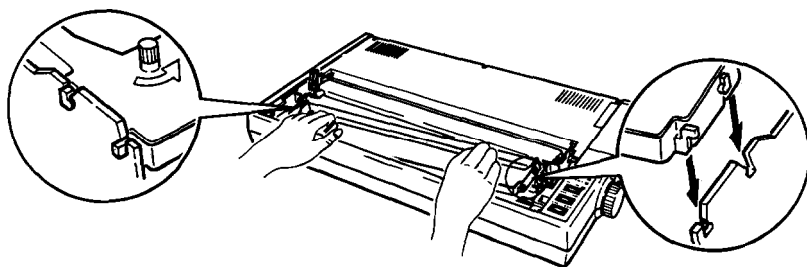


CAUTION: Never move the print head while the printer is turned on because this can damage the printer. Also, if you have been using the printer, the print head may be hot; let it cool for a few minutes before touching it.

2. Remove the ribbon cartridge from its box and remove the plastic wrapper.
3. Turn the ribbon-tightening knob in the direction of the arrow. This removes any excess slack in the ribbon and makes it easier to install.



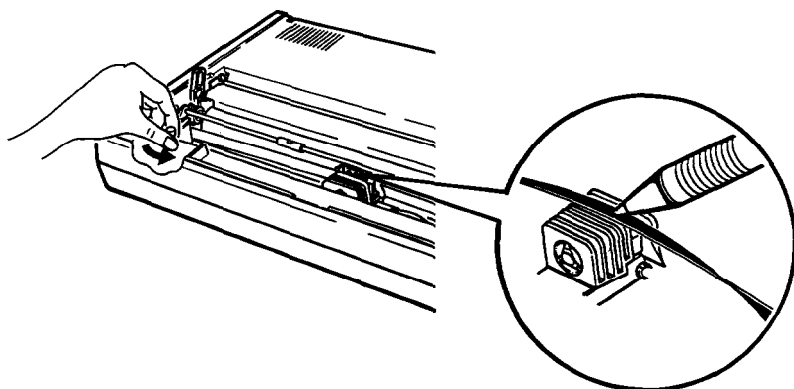
4. Hold the ribbon cartridge by its handle and push it firmly down into position, making sure the plastic hooks fit into the printer.



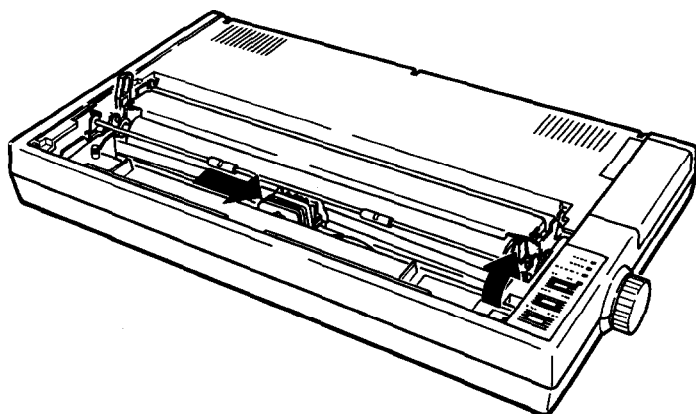
Press lightly on both sides of the cartridge to be sure the hooks are properly inserted.

Assembling the Printer

5. Use a pointed object, such as the tip of a pencil, to guide the ribbon between the print head and ribbon guide while you turn the ribbon-tightening knob to help feed the ribbon into place.



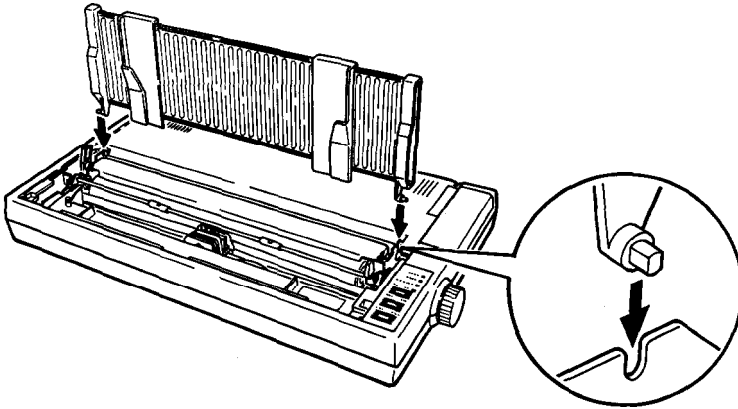
6. Slide the print head from side to side to be sure it moves smoothly. Also check that the ribbon is not twisted or creased.



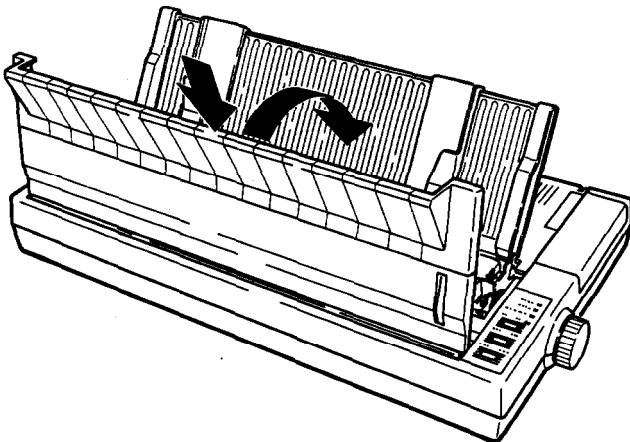
Attaching the paper guide

The paper guide functions to feed the paper smoothly and efficiently. Follow these steps to install the paper guide:

1. Push the paper release lever back. Insert the paper guide pegs into the slots on the printer; then lean the guide back until it locks into place.

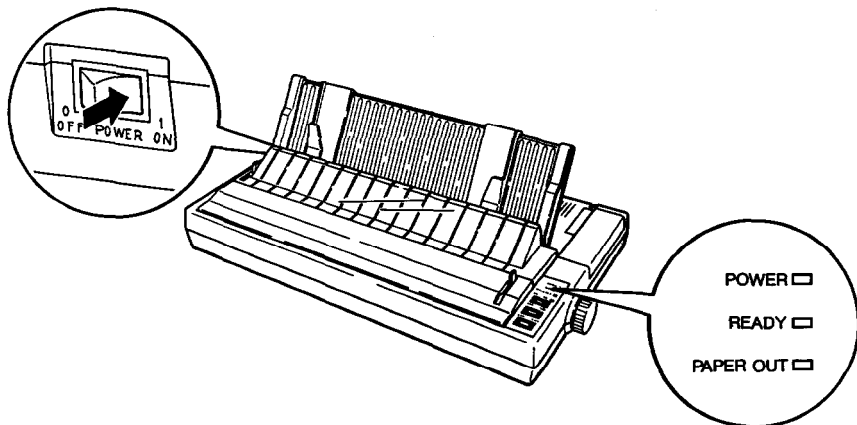


2. Attach the printer cover.

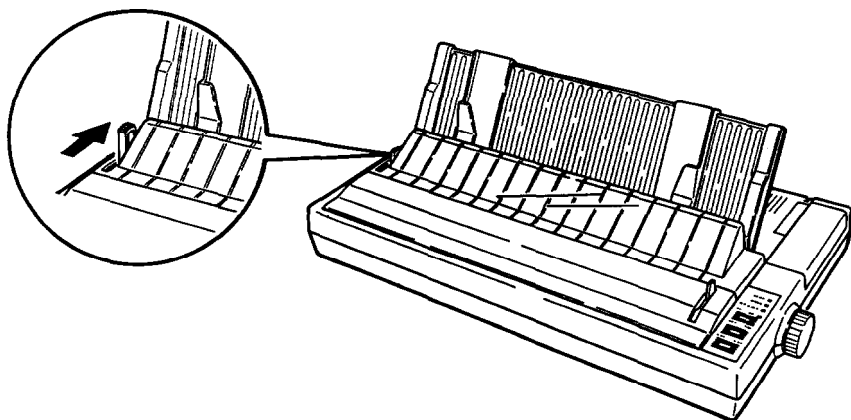


Assembling the Printer

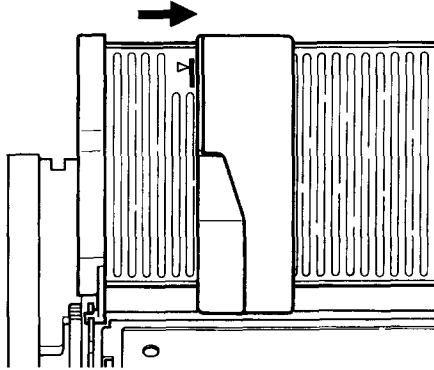
3. Turn on the printer. The green POWER and red PAPER OUT lights come on.



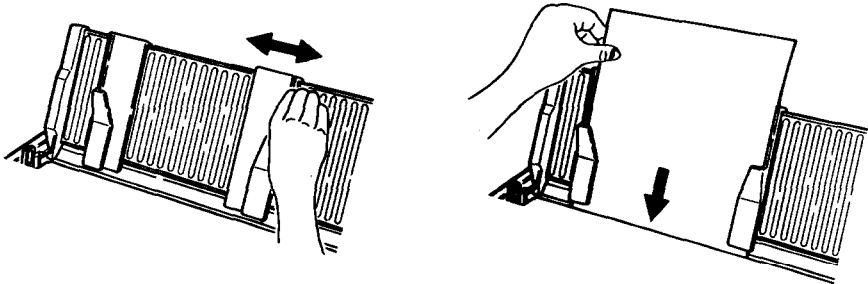
4. Be sure that the paper release lever is pushed back to the single-sheet position.



5. Move the left edge guide so it locks in place next to the guide mark.



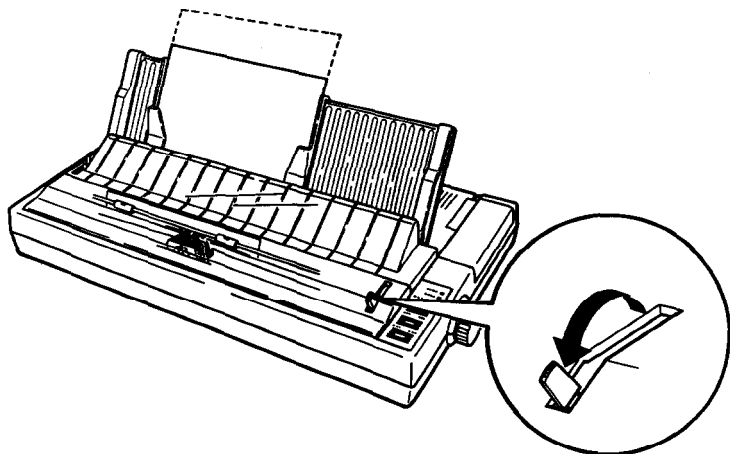
6. Adjust the right edge guide to match the width of your paper. Next, slide a sheet down between the edge guides until it meets resistance.



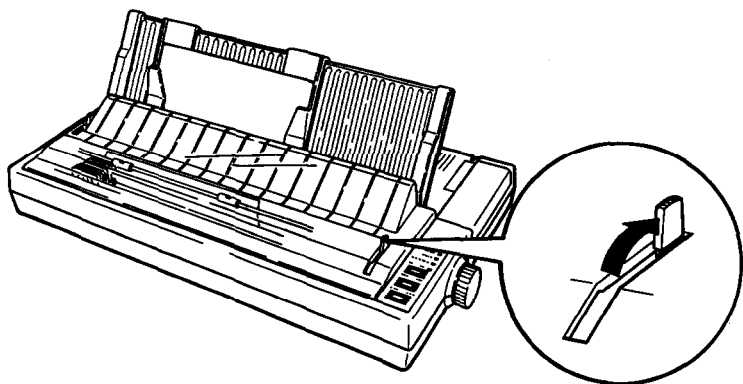
WARNING: Run the self test using paper wider than **14 inches (364 mm)** to prevent the print head from printing directly onto the platen.

Assembling the Printer

7. Pull the paper bail lever forward to automatically load the paper.



8. When the paper stops, push the paper bail lever back.



Note: If the platen turns without loading the paper, remove the paper and reinsert it more firmly; then pull the paper bail lever forward.

Testing the Printer

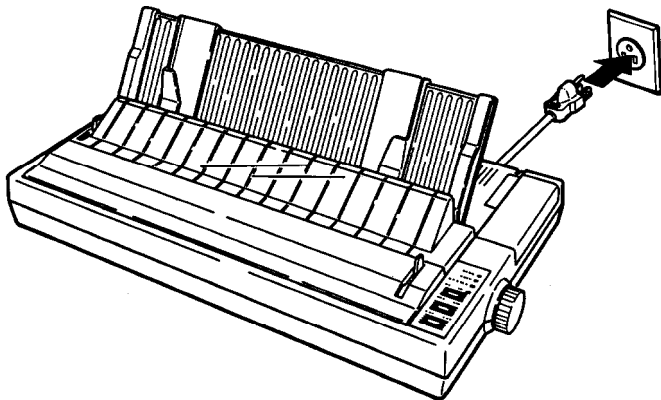
Now that your printer is fully assembled, you can use the built-in self test function to see that the printer is working correctly even though it is not connected to a computer. Be sure to perform this test to check that your printer is operating properly.

Before running the self test, you need to connect your printer to an electrical outlet and load a sheet of paper.

Plugging in the printer

Follow these steps to plug in the printer:

1. Be sure the printer is turned off.
2. Plug the power cable into a properly grounded electrical outlet.



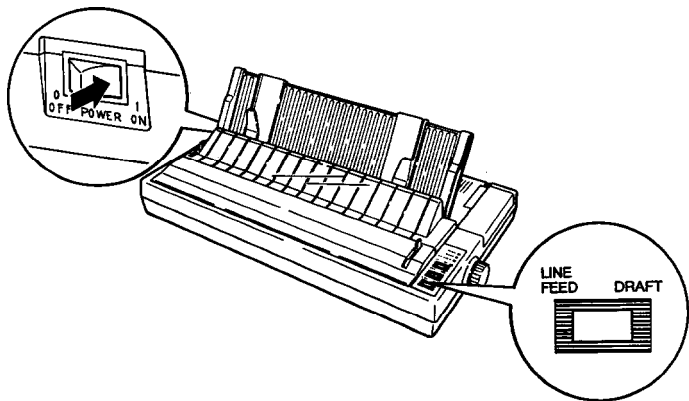
Loading a sheet of paper

Next, you need to load a sheet of paper wider than **14 inches (364 mm)**.

Running the self test

The self test can be run in draft mode or Letter Quality mode. To run the self test follow the steps below:

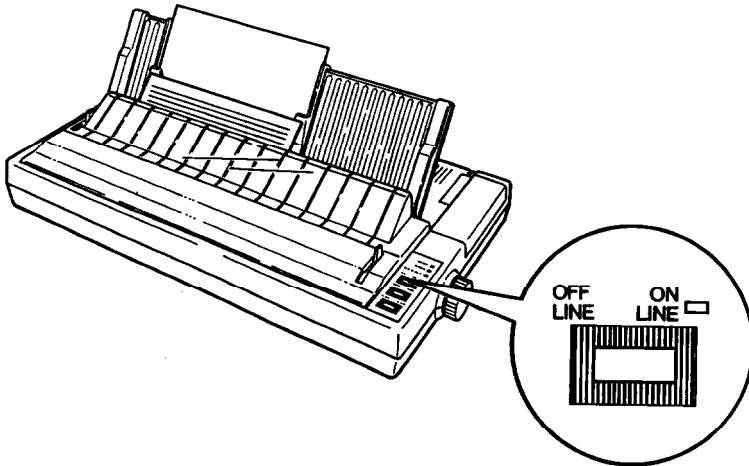
- 1. Be sure you have loaded a sheet of paper, as described before.
- 2. Turn off the printer.
- 3. While holding down the LINE FEED button (draft mode) or the FORM FEED button (Letter Quality mode), turn **on** the printer. After printing starts, release the button.



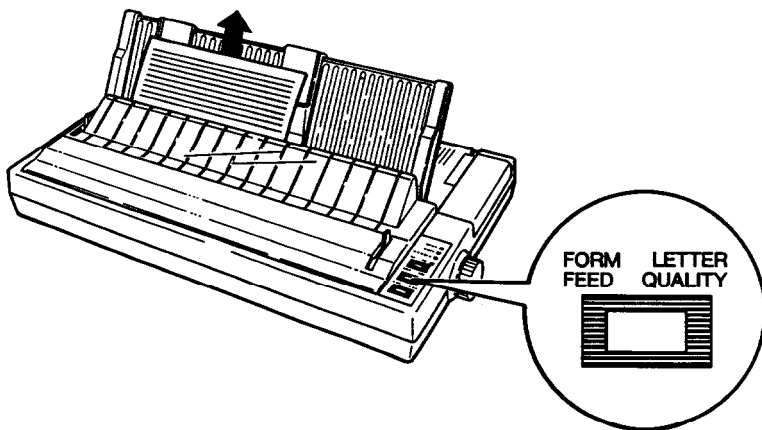
A list of your printer's settings is printed first, followed by a series of characters. Here is part of a typical Letter Quality self test:

Country	SW1-1	1-2	1-3	Page length
USA	on	on	on	11"
France	on	on	off	12"
Germany	on	off	on	CSF page length
	on	off	off	61 Lines
0%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN	on	on	on	65 Lines
\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN	off	off	off	1"skip
%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN				
&'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN				
'()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN				
()*+,-./0123456789:;<=>?@ABCDEFGHIJKLMN				

4. The self test continues until the paper runs out or you press the **ON LINE** button. If the test results are satisfactory and you wish to stop the test, press the **ON LINE** button.



5. To end the self test, be sure the printer is not printing. If paper is still loaded, press the **FORM FEED** button to eject it. Then turn off the printer.



Connecting the Printer to Your Computer

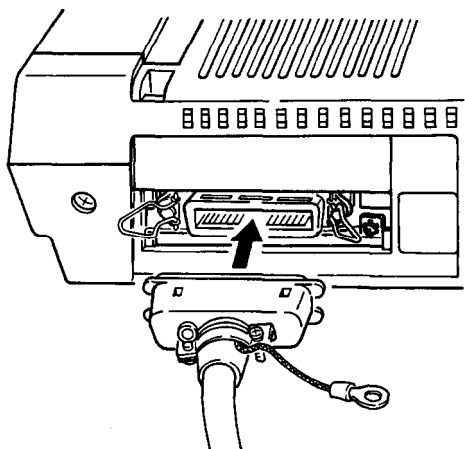
If the self test printed correctly and your printouts looked like the ones shown, you are now ready to connect your printer to the computer.

Your printer has a built-in parallel interface. If you have a suitable shielded cable, you should be able to connect your printer immediately. If you are unsure whether your computer has a parallel interface, see your computer's operating manual.

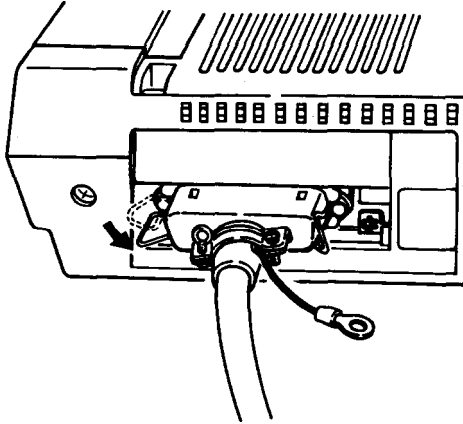
The parallel interface

Connect the parallel interface cable as described below:

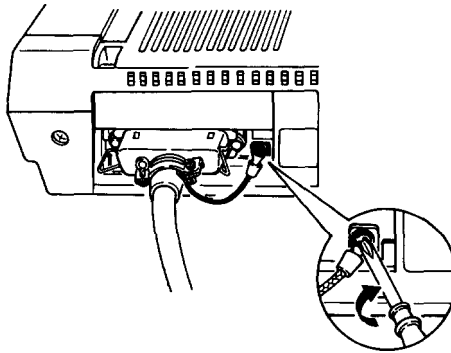
1. Be sure both the printer and computer are turned off.
2. Plug the cable connector securely into the printer.



3. Squeeze the wire clips together until they lock in place on either side of the connector.



Note: If your cable has a ground wire, connect it to the ground connector beside the interface connector.



4. Plug the other end of the cable into the computer. (If there is a ground wire at the computer end of the cable, attach it to the ground connector at the back of the computer.)

Printer Selection Menus

Most application programs let you specify the type of printer you are using so that the program can take full advantage of the printer's features. Many of these programs provide an installation or setup section that presents a list of printers to choose from.

Choosing from a menu

Because the family of Epson printers shares a great many commands, you can use an application program even if it does not list your printer on its printer selection menu. Choose from the following list (the printers are listed in the order of preference):

L-750

L-1000

LQ-850/950/1050

LQ-500

LQ-2550

LQ-2500

LQ-800/1000

LQ-1500

If none of these printers is listed, select the first one available on the following list.

EX	MX
FX	Epson printer
LX	Standard printer
RX	Draft printer

To use all the features of your printer, however, it is best to use **a** program with one of the LQ printers on its menu. If your program does not list these printers, contact the manufacturer to see if an update is available.

Chapter 3

Using the Printer

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 Selecting a font with the control panel.. 3-11

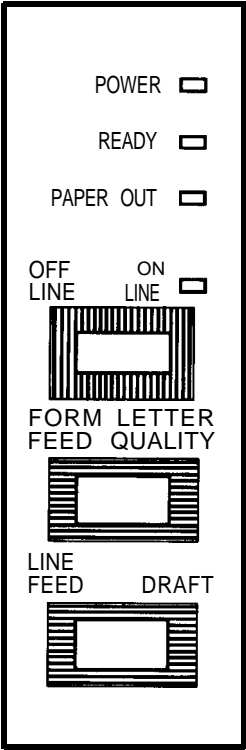
 Selecting a font with DIP switches **3-12**

Selecting an International Character Set 3-13

Choosing a Character Table..... **3-15**

Operating the Control Panel

The buttons on the control panel let you control many of the printer settings. The control panel also has indicator lights so you can check the current status of the printer's settings.



Lights

POWER:	On when the power switch is on and power is supplied.
READY:	On when the printer is ready to accept data. This light flickers during printing.
PAPER OUT:	On when the printer is out of paper.
ON LINE:	On when the printer can receive and print data from the computer. If this light flickers, the print head is overheated. In this case, the printer waits until the print head cools and then resumes printing.

Buttons

ON LINE:	This button controls the printer's on line/off line status. When the printer is on line, this light is on and the printer can receive and print data from the computer.
FORM FEED:	When the printer is off line, press this button to eject a single sheet of paper or advance continuous paper to the top of the next page. When the printer is on line, press this button to select the Letter Quality font. See the section in this chapter on selecting a font.
LINE FEED:	When the printer is off line, press this button to feed the paper one line, or hold it down to feed paper continuously. When the printer is on line, press this button to select the Draft font.

Other control panel features

The control panel also gives you access to several special functions.

Self test: By holding down the **LINE FEED** button (for draft mode) or the **FORM FEED** button (for Letter Quality mode) while you turn on the printer, you can start the printer's self test. The self test printout lets you check the current DIP switch settings and operating status of the printer.

See the section on testing the printer in Chapter 1 for more information.

Data dump: By holding down both the **LINE FEED** and **FORM FEED** buttons while you turn on the printer, you turn on the data dump mode. This feature allows advanced users to find the cause of communication problems between the printer and the software.

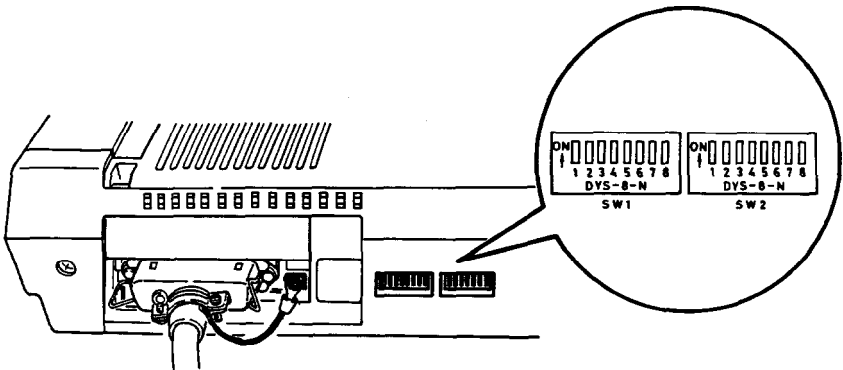
DIP Switches

By changing the settings of the two sets of DIP switches on the back of the printer, you can control various printer features, such as the character set and page length. These new settings become valid when the printer is turned on, reset, or initialized.

Setting the DIP switches

Follow these steps to set the DIP switches:

1. Be sure the printer is turned off.
2. Use a pointed instrument, such as the tip of a pen, to set the switch either on or off. The tables on the following pages give the DIP switch functions for each setting.



The new settings become valid when you turn on the printer.

DIP Switches

DIP switch functions

The tables below describe the DIP switch functions. The page numbers refer you to the page on which each printer feature is described. Note that the settings may vary depending on the country. Check the default DIP switch settings which appear on your self test printout.

DIP Switch 1

SW	Description	ON	OFF
1-1	International character set	See table on page 3-7.	
1-2			
1-3			
1-4	Font selection	See table on page 3-7.	
1-5			
1-6	Condensed mode	Condensed	Normal
1-7	Character table	Graphic	Italic
1-8	Cut sheet feeder mode	ON	OFF

DIP Switch 2

SW	Description	ON	OFF
2-1	Page length	12 inches	11 inches
2-2	CSF page length	A4 size (62 lines)	Letter size (58 lines)
2-3	Skip over perforation	ON	OFF
2-4	Auto line feed	ON	OFF
2-5	Input buffer capacity	8 Kbytes	1 Kbyte
2-6	Print direction for graphics	Bidirect	Unidirect
2-7	Character pitch selection	See table on page 3-7.	
2-8			

International character set

Country	SW1-1	SW1-2	SW1-3
USA	ON	ON	ON
France	ON	ON	OFF
Germany	ON	OFF	ON
United Kingdom	ON	OFF	OFF
Denmark I	OFF	ON	ON
Sweden	OFF	ON	OFF
Italy	OFF	OFF	ON
Spain I	OFF	OFF	OFF

Font selection

Font	SW1-4	SW1-5
Roman	OFF	OFF
Sans Serif	ON	OFF
Draft	ON	ON

Pitch selection

Pitch	SW2-7	SW2-8
10 pitch	OFF	OFF
12 pitch	ON	OFF
15 pitch	OFF	ON
Proportional	ON	ON

DIP Switches

Auto line feed

When auto line feed is on (DIP switch **2-4** on), each carriage return code (CR) is automatically accompanied by a line feed code (LF).

Input buffer capacity

The input buffer stores data from your computer. If you want to free your computer for other tasks while the printer prints, change the setting to 8 Kbytes (DIP switch **2-5** on). Before defining user-defined characters, however, be sure to set the switch to **1** Kbyte (off).

Print direction for graphics

The printer ordinarily prints text bidirectionally for speed and prints graphics characters unidirectionally for precise vertical alignment. You can, however, change text printing to unidirectional with the software command ESC U1. If DIP switch **2-6** is on, you can change graphics character printing to bidirectional with ESC **U0**. If DIP switch **2-6** is off, graphics character printing is unidirectional whether or not ESC U0 is used.

Page length

DIP switch 2-1 lets you select a page length of 11 inches (27.94 cm) or 12 inches (30.48 cm). If you are using paper that is 12 inches long, you can set this switch on. (Factory setting is off for 11 inch paper.)

Skip over perforation

DIP switch 2-3 controls the skip over perforation function. If this switch is on when you are using continuous paper, the printer leaves a one-inch margin between the last printed line on one page and the first printable line on the next page so that the printer skips over the perforation.

Most application programs take care of the top and bottom margins. Therefore, do not turn on skip over perforation unless your program does not provide these margins.

If you adjust your top of form position to the proper point, you can get half of the margin at the bottom of one page and half at the top of the next page as shown below.

DIP SW2-3 OFF (Skip over perforation OFF)

- 23456789: ; <=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]
3456789: ; <=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^
- 456789: ; <=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^
56789: ; <=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_
6789: ; <=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_'a
- 789: ; <=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_'at
89: ; <=>?@ABCDEFGHIJKLMNOPBRSTUVWXYZ[\]^_'abc
9: ; <=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_'abcd
- : ; <=>?@ABCDEFGHIJKLMNOPBRSTUVWXYZ[\]^_'abcde

DIP SW2-3 ON (Skip over perforation ON)

- | | |
|---|--|
| <ul style="list-style-type: none"> • 23456789: ; <=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]' • 3456789: ; <=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_ • | <ul style="list-style-type: none"> • 456789: ; <=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_
56789: ; <=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_'a
6789: ; <=>?@ABCDEFGHIJKLMNPOQRSTUVWXYZ[\]^_' a1 |
|---|--|

Selecting Typestyles

Your printer can produce a wide range of typesyles by using different character fonts, pitches, widths, and other enhancements. You can select the character font using the control panel or by setting DIP switches.

Built-in character fonts

Your printer has three built-in character fonts.

DRAFT

!"#\$%&'()*+,-./0123454789:;<=>?@ABCDEFGHIJK
LMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz
WXYZ[\]~

We've just seen your excellent ad for
miniature zebras in a recent back issue of
Trader's Times. What is the price schedule
for quantities over one gross?

ROMAN

!"#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJK
LMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz
wxyz{|}~

We've just seen your excellent ad for
miniature zebras in a recent back issue of
Trader's Times. What is the price schedule
for quantities over one gross?

SANS SERIF

!“#\$%&'()*+,-./0123456789:;<=>?@ABCDEFGHIJK
LMNOPQRSTUVWXYZ[\]^_`abcdefghijklmnopqrstuvwxyz
wxyz { | } ~

We've just seen your excellent ad for miniature zebras in a recent back issue of Trader's Times. What is the price schedule for quantities over one gross?

Draft mode uses fewer dots per character for high-speed printing, which makes it ideal for rough drafts and editing work.

Roman and Sans Serif are Letter Quality (LQ) fonts. Letter Quality takes a little longer to print, but produces fully-formed characters for presentation-quality documents.

Selecting a font with the control panel

To select a font using the control panel buttons, follow these steps:

1. Be sure the printer is on, contains paper, and is on line.
2. Check to see that the printer is not receiving data (the READY light should not be flickering).

Draft: Press the LINE FEED button to select Draft. The beeper sounds once **when** draft is selected.

Roman: Press the FORM FEED button to select Roman. Two short (**0.1 s**) beeps sound when Roman is selected.

Sans Serif: Press the FORM FEED button to select Sans Serif. Two long (**0.6 s**) beeps sound **when** Sans Serif is selected.

The font selected by the FORM FEED or LINE FEED button remains valid until another font is selected by a software command or until the printer is turned off, reset, or initialized.

Selecting a font with DIP switches

You can set your favorite font as the default font by setting DIP switches 1-4 and 1-5.

The printer comes with Roman as the default font. If you wish to change it, set the DIP switches as shown in the following table.



CAUTION: Be sure the printer is turned off before changing any DIP switch settings.

Font	SW1-4	SW1-5
Roman	OFF	OFF
Sans Serif	ON	OFF
Draft	ON	ON

In addition to font selection, you can also change the character pitch and add other print enhancements by using software commands listed in the Command Summary, Chapter 6.

•

Selecting an International Character Set

Selecting an international character set provides you with the characters and symbols used in other languages. By setting the DIP switches, you **can** select one of eight international character sets.

To select an international character set, see DIP switches 1-1, 1-2, and 1-3 ‘according to the table below. This table shows **the** characters in each international character set.

Country	ASCII code (hex)												DIP SW		
	23	24	40	5B	5C	5D	5E	60	7B	7C	7D	7E	1-1	1-2	
0 USA	#	\$	@	[\]	^	`	{	!	}	~	ON	ON	ON
1 France	#	\$	à	°	ç	§	^	`	é	ù	è	¨	ON	ON	OFF
2 Germany	#	\$	§	Ä	Ö	Ü	^	`	ä	ö	ü	ß	ON	OFF	ON
3 UK	£	\$	@	[\]	^	`	{	!	}	~	ON	OFF	OFF
4 Denmark I	#	\$	@	Æ	Ø	Å	^	`	æ	ø	å	~	OFF	ON	ON
5 Sweden	#	¤	É	Ä	Ö	Å	Ü	é	ä	ö	å	ü	OFF	ON	OFF
6 Italy	#	\$	@	°	\	é	^	ù	à	ò	è	ì	OFF	OFF	ON
7 Spain I	¤	\$	@	i	Ñ	¿	^	`	¨	ñ	}	~	OFF	OFF	OFF



CAUTION: When you change the setting of a DIP switch, be sure to first turn off the printer. After changing the setting, turn the printer back on.

Selecting an International Character Set

Besides the eight sets above, the six international character sets, and the legal set shown below are also available through the ESC R command.

Country	ASCII code (hex)											
	23	24	40	58	5C	5D	5E	60	7B	7C	7D	7E
8 Japan	#	\$	@	[¥]	^	`	{	!	}	~
9 Norway	#	¤	É	Æ	Ø	Å	Ü	é	æ	ø	å	ü
10 Denmark II	#	<i>\$</i>	<i>É</i>	<i>Æ</i>	<i>Ø</i>	<i>Å</i>	<i>Ü</i>	<i>é</i>	<i>æ</i>	<i>ø</i>	<i>å</i>	<i>ü</i>
11 Spain II	#	\$	á	í	Ñ	¿	é	`	í	ñ	ó	ú
12 Latin America	#	\$	á	í	Ñ	¿	é	ü	í	ñ	ó	ú
13 Korea	#	\$	@	[₩]	^	`	{	!	}	~
64 Legal	#	\$	§	°	`	"	¶	`	©	®	†	™

Choosing a Character Table

DIP switch 1-7 selects the italic character table or the Epson Extended Graphics character table. The Epson Extended Graphics table contains international accented characters, Greek characters, mathematical symbols, and character graphics for printing lines, corners, and shaded areas.

If you have an IBM® or compatible computer, select Epson Extended Graphics by setting DIP switch 1-7 on. You can then print both text and the character graphics that are displayed on your screen. Also you can still print italics using the ESC 4 command. Samples of italics and Epson Extended Graphics are shown below.

Italics

```
!"#$%&'()*+,-./0123456789:;<=>?@ABCDEFGH  
IJKLMNOPQRSTUVWXYZ[\]^_`abcdefghijklmno  
pqrstuvwxyz{ | } ~
```

Epson Extended Graphics



CAUTION: When you change the setting of a DIP switch, be sure to first turn off the printer. After changing the setting, turn the printer back on.

Chapter 2

Paper Handling

Using Single Sheets 2-2

 Attaching the paper guide..... 2-2

 Loading paper 2-3

 Reloading during printing 2-6

Using Continuous Paper 2-7

 Installing the pull tractor..... 2-7

 Positioning your continuous paper supply 2-9

 Loading continuous paper..... 2-9

 Attaching the paper separator 2-14

 Setting the top of form position..... 2-14

 When you have finished printing 2-16

Printing on Special Paper 2-17

 The paper thickness lever 2-17

 Using multi-part forms 2-19

Using Single Sheets

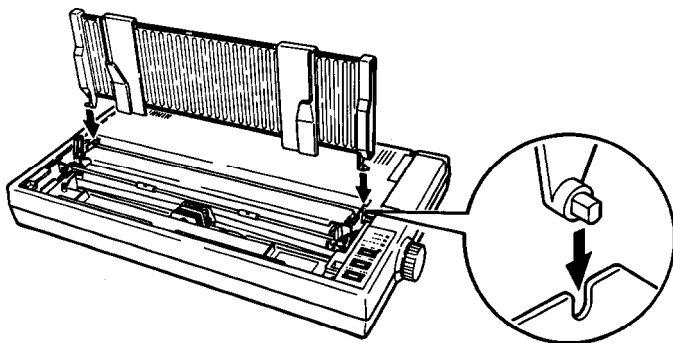
Your printer can accommodate single sheets with a width of 7.2 inches (182 mm) to 14 inches (264 mm).

If the pull tractor unit is installed, you need to remove it before you can print on single sheets. See “Removing the pull tractor” in Chapter 1.

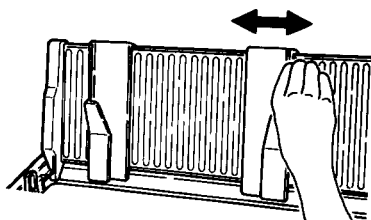
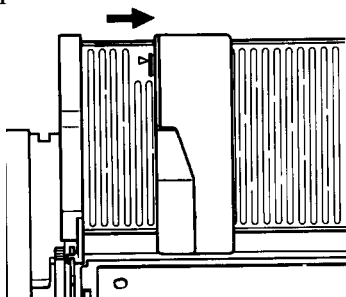
Attaching the paper guide

Follow these steps to attach the paper guide:

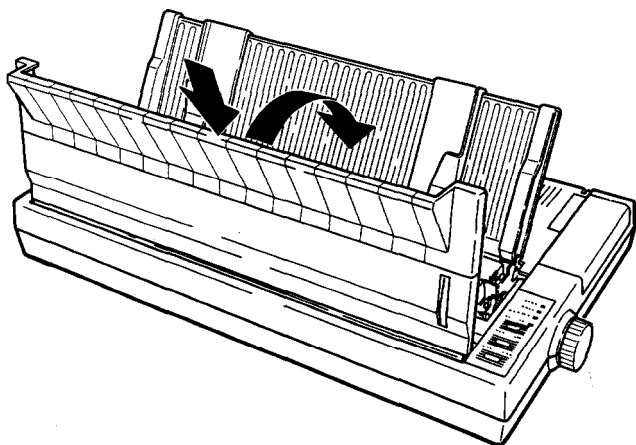
1. Push the paper release lever back. Insert the paper guide pegs into the slots on the printer; then lean the guide back until it locks into place.



2. Slide the left edge guide until it locks in place at the guide mark. Next adjust the right edge guide to match the width of your paper.



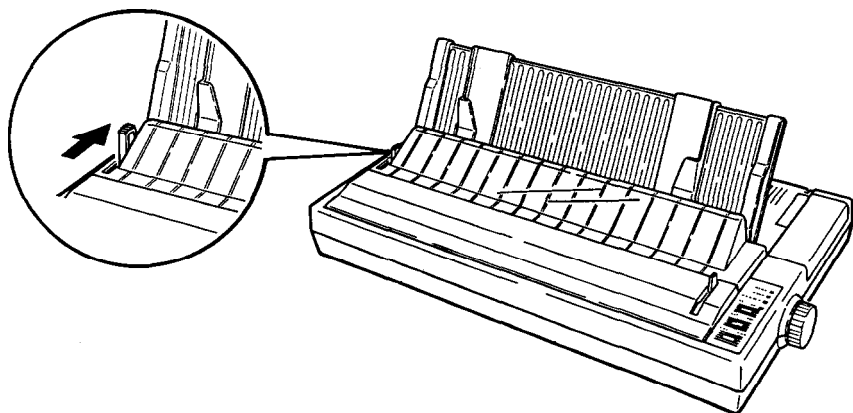
3. Attach the printer cover.



Loading paper

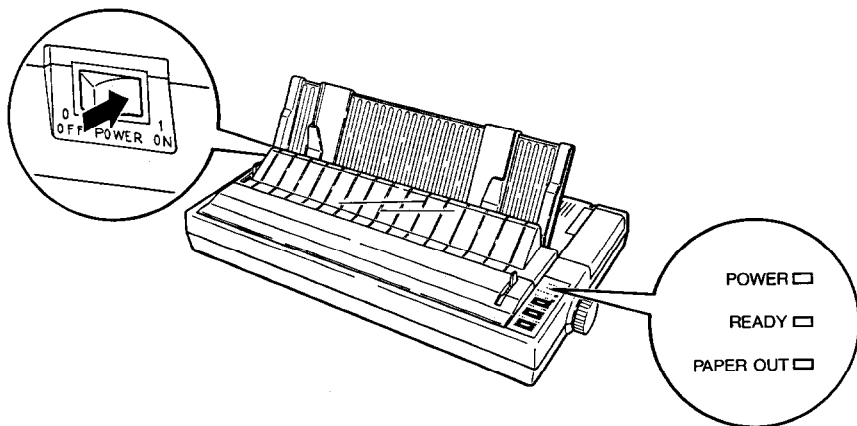
Follow these steps to load paper in the printer:

1. Push the paper release lever back as shown below.

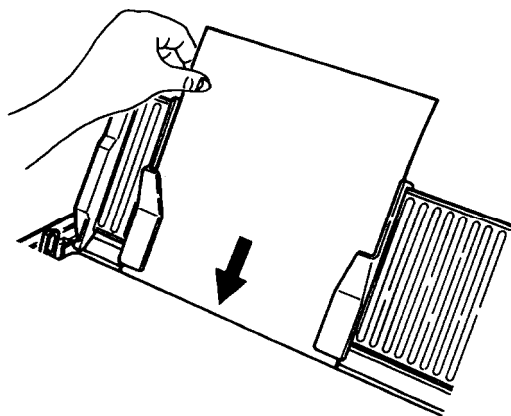


Using Single Sheets

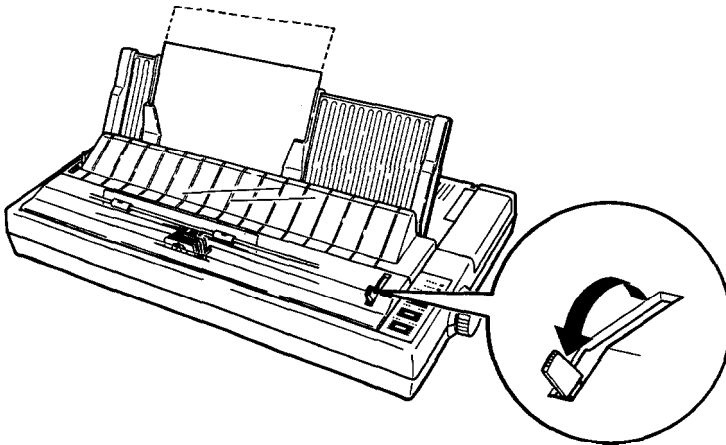
2. Turn on the printer. The POWER and PAPER OUT lights should be on.



3. Slide the paper down between the edge guides until it meets resistance.

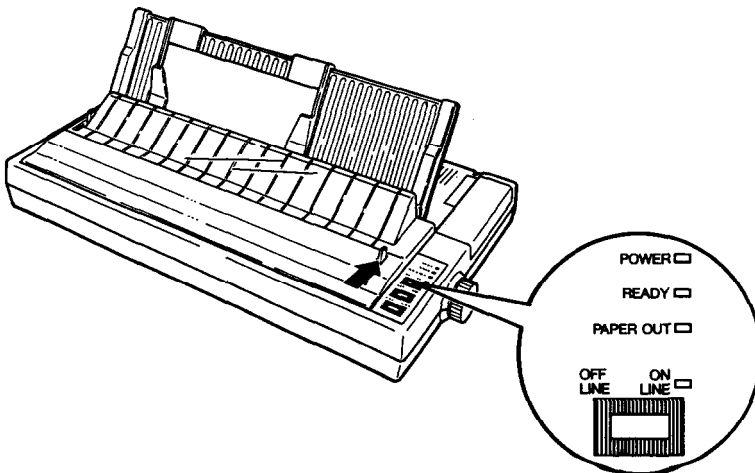


4. Pull the paper bail lever toward you to load the paper automatically.



Note: If the platen turns without loading the paper, completely remove the paper and reinsert it more firmly. Then pull the lever again.

5. Push the paper bail lever back; then press the ON LINE button to set the printer **on** line.



To eject the paper, set the printer off line (by pressing the ON LINE button) and then press the FORM FEED button.



CAUTION: Never advance the paper using the paper feed knob while the printer is turned on.

Reloading during printing

When you print a document more than one page long using single sheets of paper, there are two ways your software can allow you to load a new sheet at the end of a printed page:

- If your software sends characters in a continuous stream, the printer stops printing when it reaches the bottom of the paper. When this happens, the page ejects and the ON LINE light goes off automatically.
- If your software handles printing page by page, it probably stops sending characters at the end of a page and prompts you to insert more paper. In this case, the ON LINE light may remain on. If it does, the first thing you should do is press the ON LINE button once to take the printer off line.

In either case, once the ON LINE light is off, remove the sheet that has just been printed and load a new sheet as before.

Press the ON LINE button to start printing the next page.

Using Continuous Paper

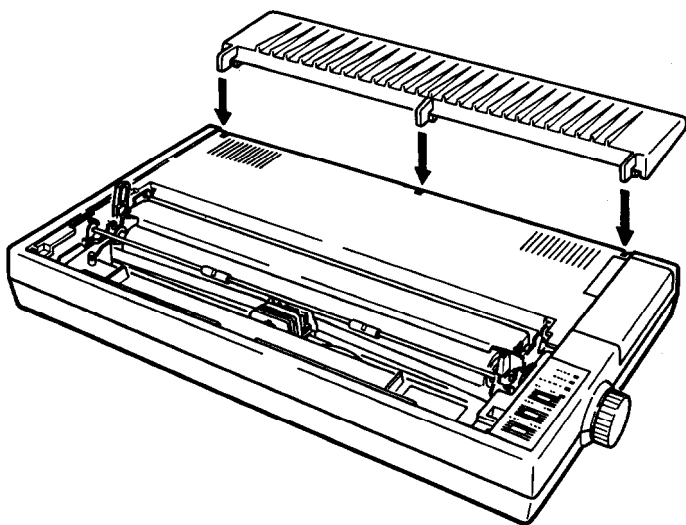
To print on continuous paper, you need to install the pull tractor unit. With the pull tractor installed, you can print on continuous paper with a width of 4 inches (101 mm) to 16 inches (406 mm).

If the pull tractor is already installed, skip to “Positioning your continuous paper supply” later in this chapter.

Installing the pull tractor

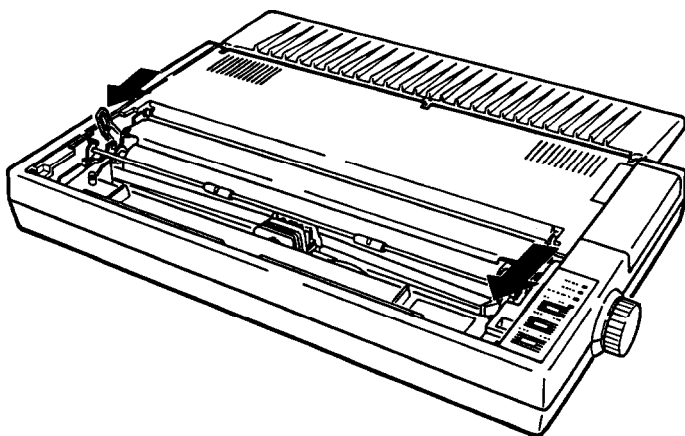
Follow these steps to install the pull tractor:

1. Turn off the printer and remove the printer cover and paper guide.
2. Attach the paper rest.

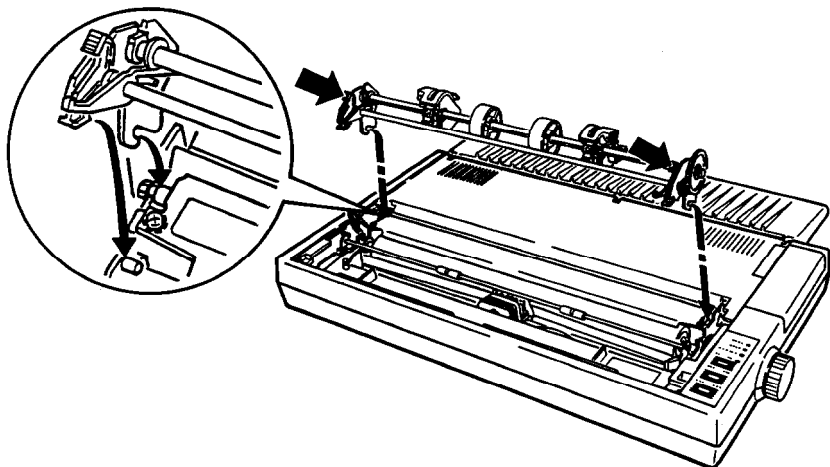


Using Continuous Paper

3. Pull the **paper** release lever and paper bail lever toward you.

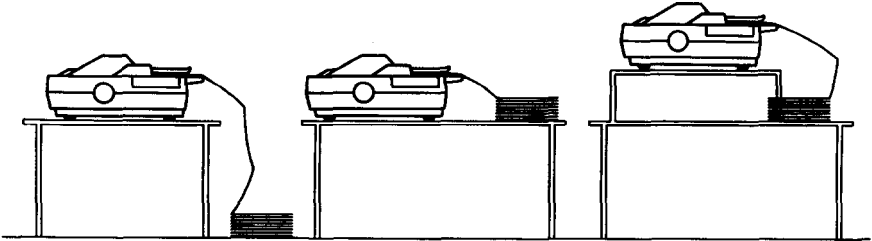


4. Hold the pull tractor with the gears to the right. Fit the rear notches on the tractor over the rear mounting rods on the printer. Then tilt the tractor unit toward you until the front latches click in place over the front mounting rods of the printer.



Positioning your continuous paper supply

Here are three ways to position your printer and supply of continuous paper.

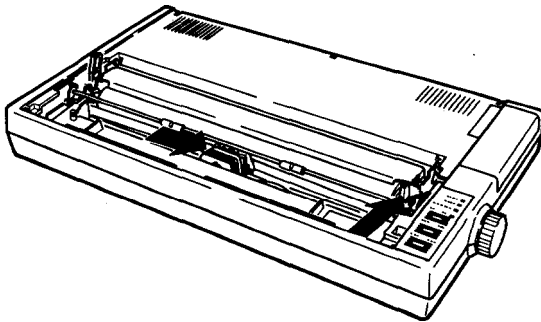


It is also important to align your paper supply with the paper loaded in the tractor so that the paper feeds smoothly and straight into the printer.

Loading continuous paper

Follow these steps to load continuous paper:

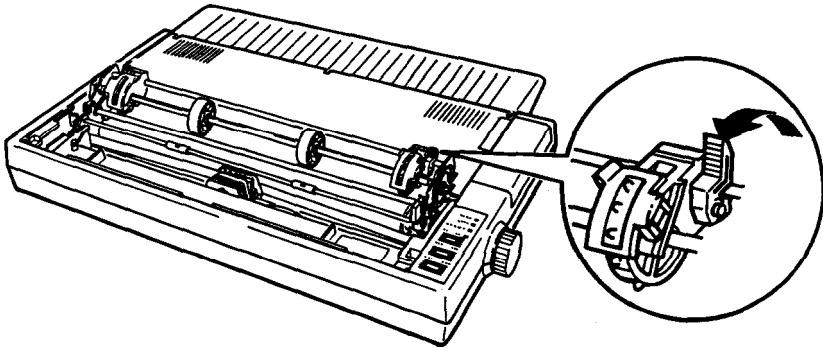
1. Turn off the printer.
2. Push the paper bail lever back; then slide the print head to the middle of the printer.



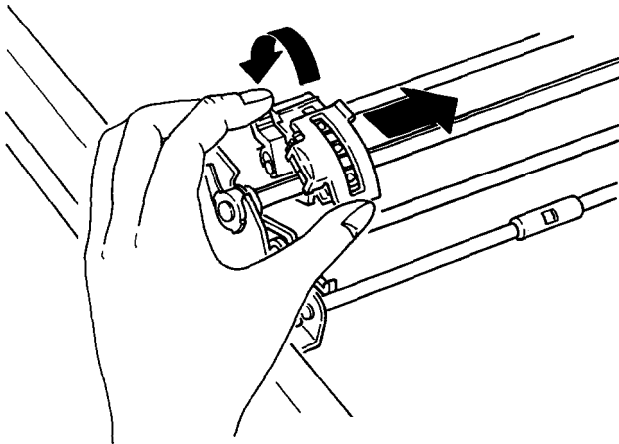
WARNING: If the printer has been used recently, the print head may be hot. Let it cool before attempting to move it.

Using *Continuous Paper*

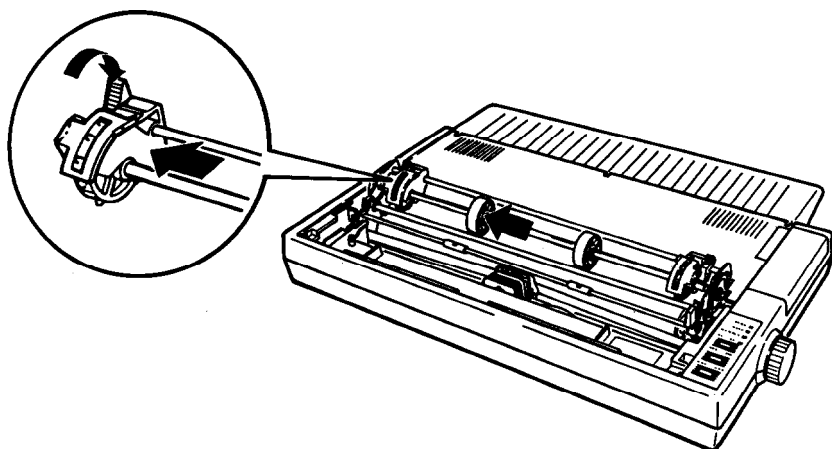
3. Pull the sprocket lock levers forward to unlock the sprocket frame.



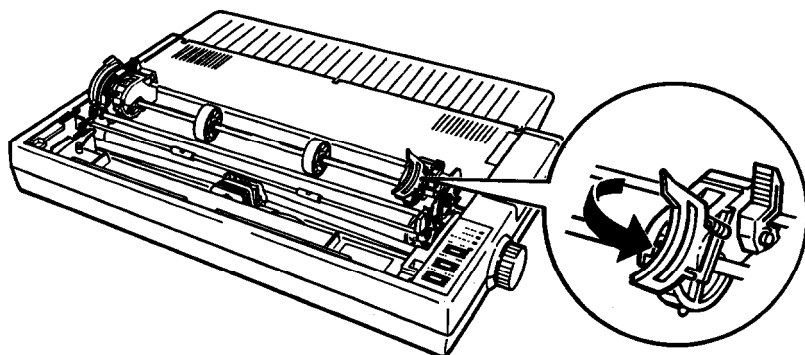
4. Slide the left sprocket frame to approximately 3/4 inch (20 mm) from the far left position. Then push the sprocket lever back to lock it in place.



5. Slide the right sprocket frame to match the width of your paper, but do not lock it. Then position the paper supports between the two sprocket frames as shown below.

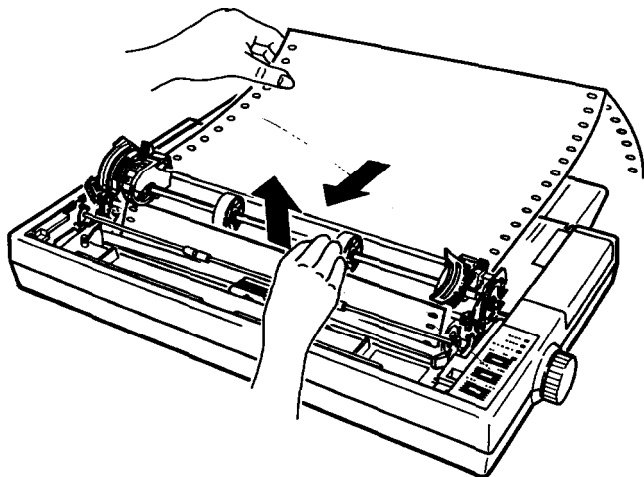


6. Open both sprocket covers.

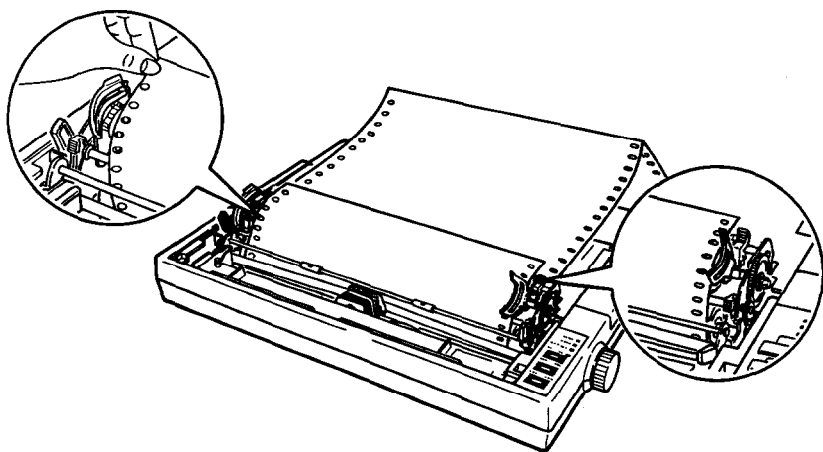


Using Continuous Paper

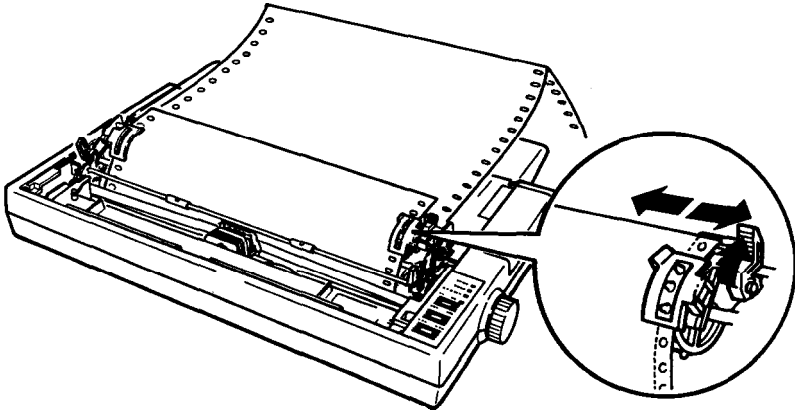
7. Be sure your paper has a clean, straight edge and then insert the paper into the printer until it emerges between the platen and the ribbon guide. Pull it up to the sprocket frames.



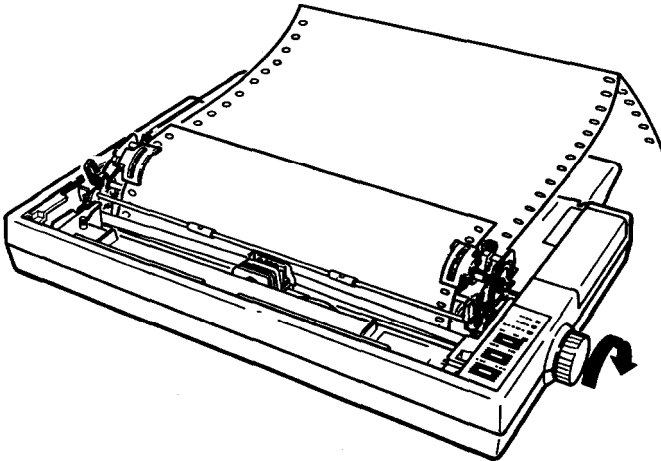
8. Fit the holes of the paper over the tractor pins of the sprocket frames, and then close the sprocket covers.



9. Adjust the position of the right sprocket frame to remove any slack across the paper and then lock it into place.

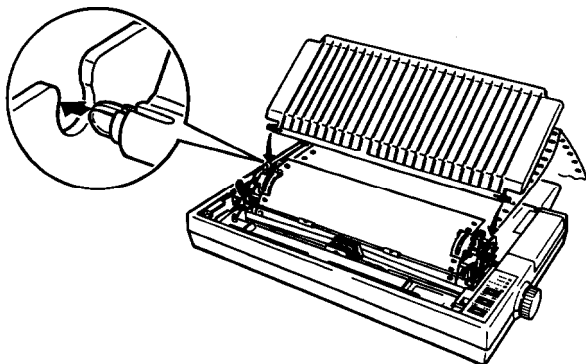


10. If there is slack in the paper between the print head and the tractor unit, use the paper feed knob to take up the slack.



Attaching the paper separator

With continuous paper, you need to attach the paper separator to avoid paper jams. First, align the pins of the paper separator with the slots on the printer and then rest the separator on the printer.

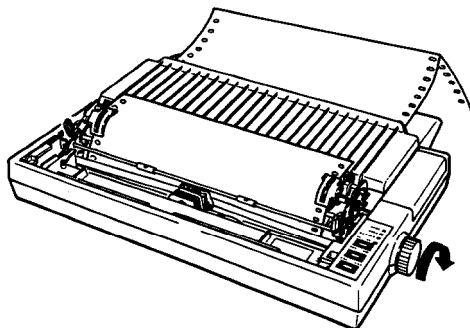


Setting the top of form position

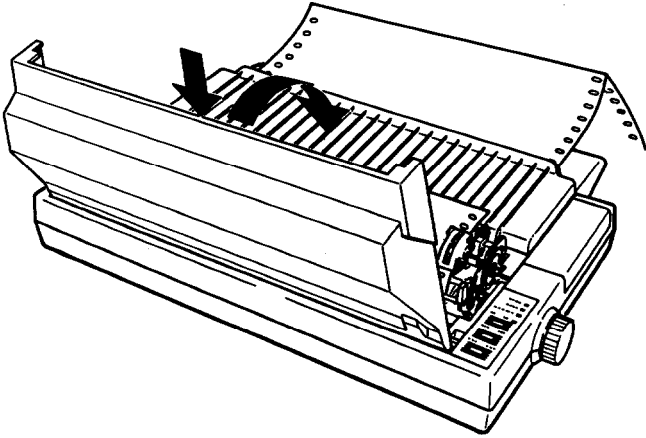
It is important to set the top of form position properly because this position determines the first printable line of each page. The top of form position remains valid until the printer is turned off, reset, or initialized.

Follow these steps to set the top of form position:

1. Turn off the printer.
2. Use the paper feed knob to feed the paper until the perforation is just about even with the ribbon.



3. Attach the tractor cover to the printer.



4. Turn on the printer.



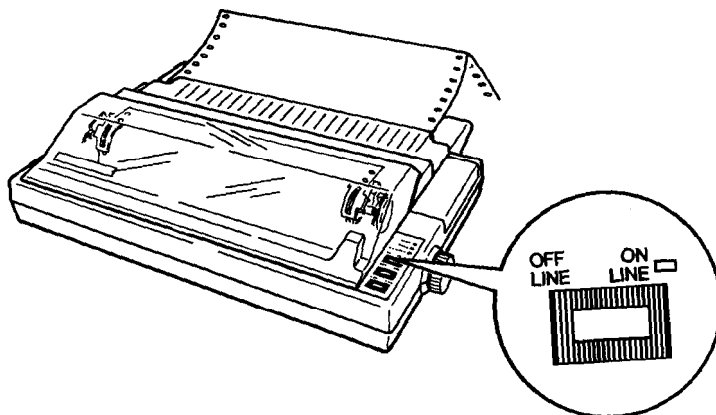
CAUTION: If you use the paper feed knob to feed the paper after turning on the printer, the printer loses track of the set position. If you wish to retain the set top of form position, be sure to use the **LINE FEED** button or the **FORM FEED** button to feed the paper.

Using Continuous Paper

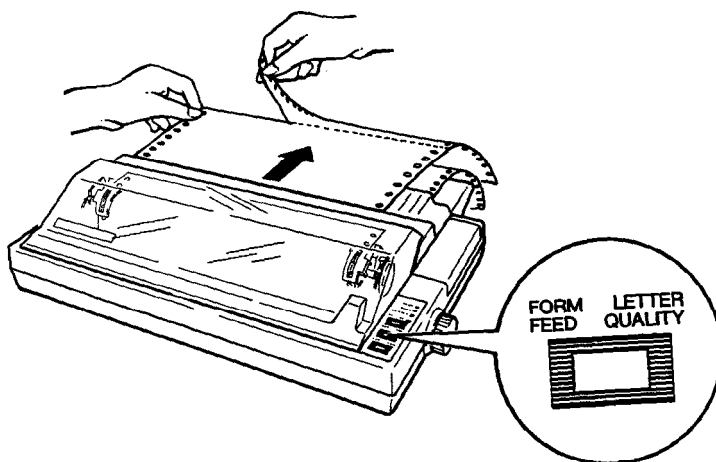
When you have finished printing

To tear off the paper after you have finished printing, follow the steps below:

1. After printing is completed, set the printer off line.



2. Press the FORM FEED button to feed the paper forward, and then tear it off at the perforation.



Printing on Special Paper

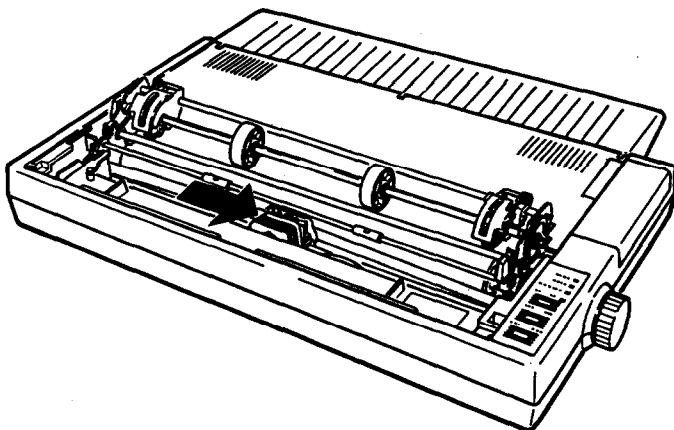
In addition to printing on single sheets and continuous paper, your printer can also print on a wide variety of paper types, such as multi-part forms. Before printing on special types of paper, you need to change the paper thickness setting.

WARNING: You cannot use multi-part forms with the printer's single-sheet feeding system.

The paper thickness lever

Change the position of the paper thickness lever as follows:

1. Turn off the printer.
2. Remove the tractor cover.
3. Slide the print head to the middle of the printer.

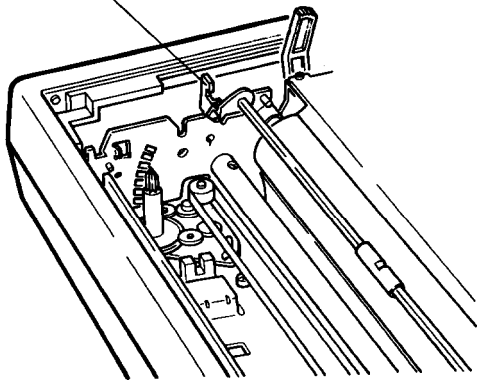


WARNING: If the printer has been used recently, the print head may be hot. Let it cool before attempting to move it.

Printing on Special Paper

4. Set the paper thickness lever to match the thickness of your paper, according to the table below.

Paper thickness lever

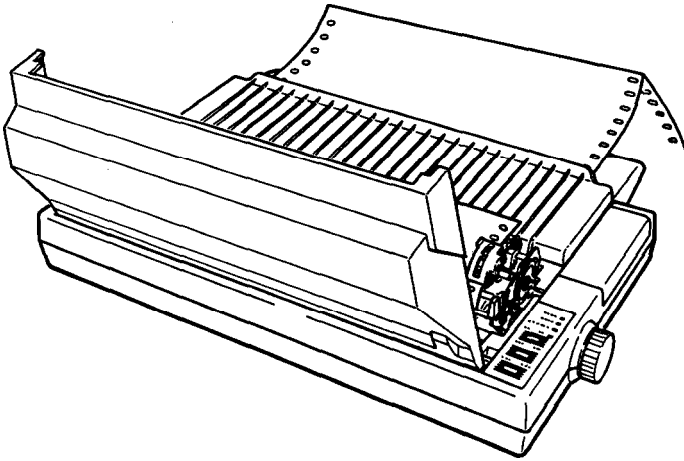


Paper Type	Lever Position
Ordinary (single sheets or continuous)	2
Thin paper	2 or 1
Multi-part paper	
2 sheets (original + 1 copy)	3
3 sheets (original + 2 copies)	4



WARNING: Always return the lever to position 2 when you go back to printing on ordinary paper.

5. Attach the tractor cover.



Using multi-part forms

With the pull tractor unit installed, you can print on continuous multi-part forms. You can use multi-part forms up to three sheets thick including the original. Be sure you set the paper thickness lever to the proper position using the table on the previous page.



WARNING: When printing multi-part forms, be sure the printing does not exceed the printable range of your forms.

Except for the paper thickness lever setting, you load multi-part paper the same way as continuous paper. For details, see the section in this chapter on loading continuous paper. Pay special attention to setting the top of form position.



WARNING: Do not use multi-part forms with the single-sheet feeding system.

Chapter 4

Troubleshooting and Maintenance

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Transporting the Printer.....	4-11

Problems and Solutions

This chapter discusses problems you may encounter and their likely solutions. At the back of the chapter is a section on the data dump mode. This mode helps more experienced users determine the causes of communication problems between the printer and the computer.

This section lists possible problems and likely solutions.

The printer does not print

- Be sure that the printer is turned on and the POWER light is on. If the printer is turned on but the POWER light is not on, check to see that the printer is fully plugged in and that the electrical outlet is also turned on.
- Be sure that the ON LINE light is on. If it is not on, press the ON LINE button.
- Be sure that the printer is connected to the computer. Check both ends of the cable between the printer and the computer.
- Be sure that the printer is not out of paper. (The PAPER OUT light should be off.)

If the printer still does not print, disconnect the printer from the computer and try the self test described in Chapter 1. If the self test works properly, the printer is working, and the problem probably lies in the computer, the software, or the cable. If the self test does not work, contact the store where you purchased your printer or call the Epson toll-free number.

The printout is spaced incorrectly

Text is printed all on one line, or the printer is inserting extra blank lines between lines of text.

- If all the text is printed on the same line, no **line** feed signal is being sent at the end of each line of text. Turn DIP switch 2-4 on.
- If the printer is inserting extra blank lines between lines of text, extra line feed signals are being sent. Turn DIP switch 2-4 off.
- If the printer inserts extra blank lines even after turning DIP switch 2-4 off, disable the AUTO FEED XT signal of your interface.

The printout is faint or uneven

- The ribbon may not be properly installed. See the section on ribbon installation in Chapter 1.
- The ribbon may be worn out. See the section on replacing the ribbon later in this chapter.
- The paper thickness lever may be in the wrong position. See the section on the paper thickness lever in Chapter 2.
- The print head may be worn out. This is especially likely if parts of printed characters are missing. Contact your Authorized Epson Dealer to have the head replaced. Never attempt to replace the head yourself because other parts of the printer should be checked at the same time.

The printer stops printing

- The printer may be out of paper. Check the paper supply.
- The paper may be jammed. Remove the jammed paper and reload.
- The ribbon may be jammed. See the section on replacing the ribbon later in this chapter.
- If the READY light is off and the ON LINE light is flickering, the printer has stopped to allow the print head to cool. Printing resumes soon; you do not have to do anything to restart it.
- If the printer stops, the beeper sounds, and the ON LINE light does not flicker, turn the printer off and then turn it back on and try to print again. If the printer beeps again and does not print, take it to a qualified service person.

Single sheets do not feed properly

- The position of the paper release lever may be wrong. Push it back to the single-sheet position.
- The paper may be too large or too small. See the printer's paper specifications in Chapter 5.
- The paper guide may not be installed properly. See the section on attaching the paper guide in Chapter 2.
- The cut sheet feeder mode may be selected by the DIP switch. See the section on setting DIP switches in Chapter 3.

Continuous paper does not feed properly

- The position of the paper release lever may be wrong. Pull it forward to the continuous paper position.
- The paper may not be mounted on the sprockets correctly. See that the sprocket holes of the paper fit correctly over the sprockets.
- The paper separator may not be installed properly. See the section on continuous paper in Chapter 2.
- The paper supply may be stacked too far from the printer or not aligned with the tractor. Also, there may be some obstacle in the way of the paper or something on top of the paper supply. See Chapter 2 for instructions on the proper placement of the paper supply.

The printout is not what you expect

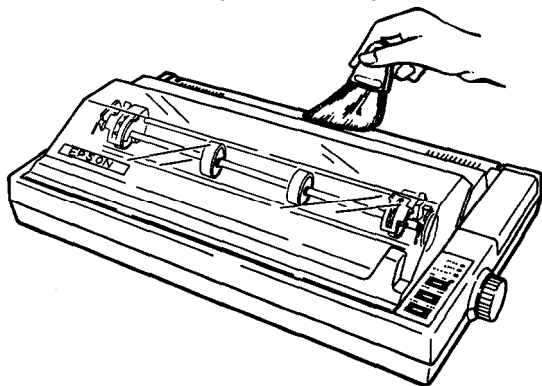
- The wrong international character set may be selected. See the section on international character sets in Chapter 3.
- The wrong character table (italics or Epson Extended Graphics) may be selected. See the section on character tables in Chapter 3.
- The font, pitch, or size may not be selected properly. See that your software is correctly set up for your printer.
- Your application program may be changing the SelecType settings. Use the program's setup (or installation) procedure to remove the codes that interfere with your SelecType settings. Another solution is to use the printer control codes for your application program instead of SelecType to control your printing. The manual for your program can tell you how to change the printing style.

Cleaning the Printer

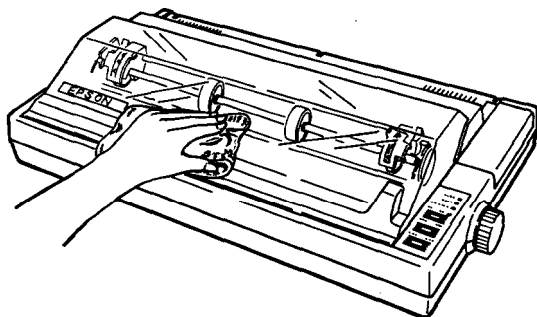
To keep your printer operating at its best, you should clean it thoroughly several times a year.

Follow these steps to clean the printer.

1. Be sure the printer is turned off.
2. Remove the paper guide and the paper rest.
3. Use a soft brush to carefully clear away all dust and dirt.



4. If the outer case or paper guide is dirty or dusty, clean it with a soft, clean cloth dampened with mild detergent dissolved in water. Keep the printer cover in place to prevent water from getting inside the printer.





WARNING:

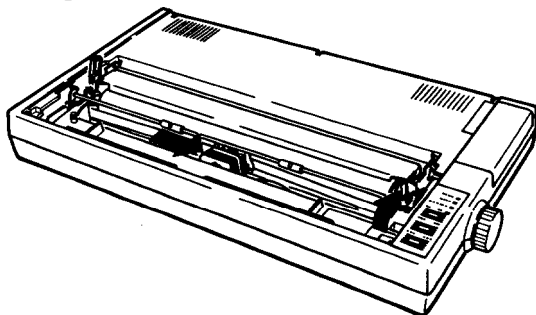
- Never use alcohols or thinners to clean the printer; these chemicals can damage the components as well as the case.
- Be careful not to get water on the printer mechanism or electronic components.
- Do not use a hard or abrasive brush.
- Do not spray the inside of the printer with lubricants; unsuitable oils can damage the mechanism. Contact your Authorized Epson Dealer if lubrication is needed.

Replacing the Ribbon

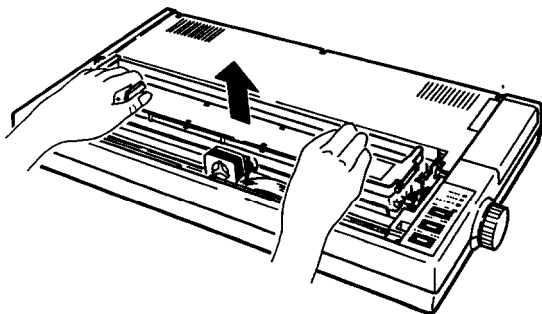
When printing becomes too faint you need to replace the ribbon. Use only the # 7754 Epson replacement ribbon cartridge with your printer.

Follow these steps to replace the ribbon:

1. Be sure the printer is turned off and printer cover is removed.
2. Push the paper bail lever back; then slide the print head to the middle of the printer.

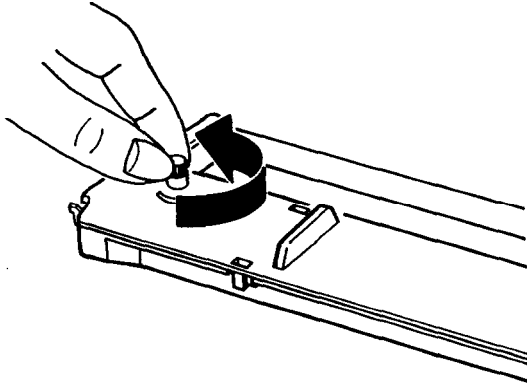


3. To remove the ribbon cartridge, lift it straight up and out of the printer.

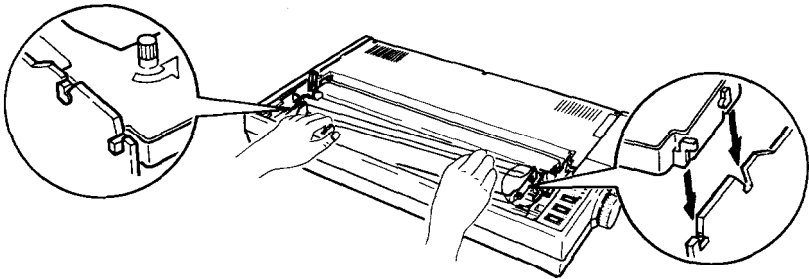


WARNING: If the printer **has** been used recently, the print head may be hot. Let it cool before attempting to replace the ribbon.

4. To remove excess slack in the new ribbon, turn the ribbon-tightening knob in the direction of the arrow.



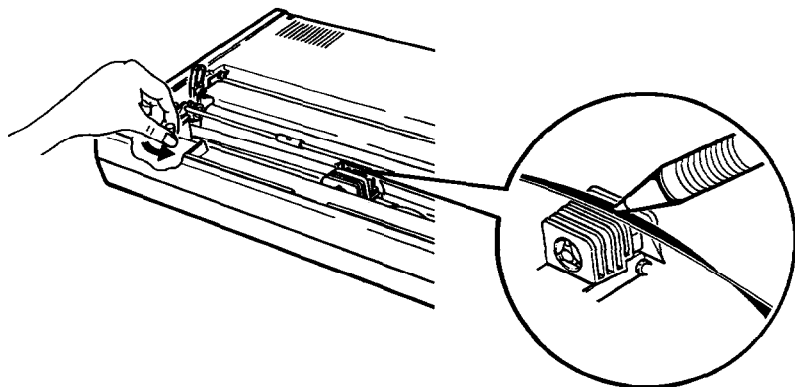
5. Push the new ribbon cartridge firmly into position, making sure the plastic hooks fit into the printer.



Note: Press lightly on both sides of the cartridge to be sure the hooks are properly inserted.

Replacing the Ribbon

6. Use a pointed object, such **as** a pencil, to guide the ribbon between the print head and ribbon guide while you turn the ribbon-tightening knob to help feed the ribbon into place.

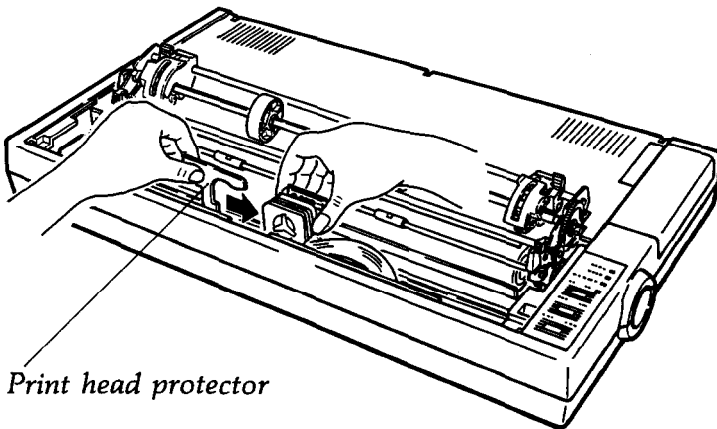


7. Slide the print head from side to side to be sure it moves smoothly. Also check that the ribbon is not twisted or creased.
8. Reattach the printer cover or tractor cover.

Transporting the Printer

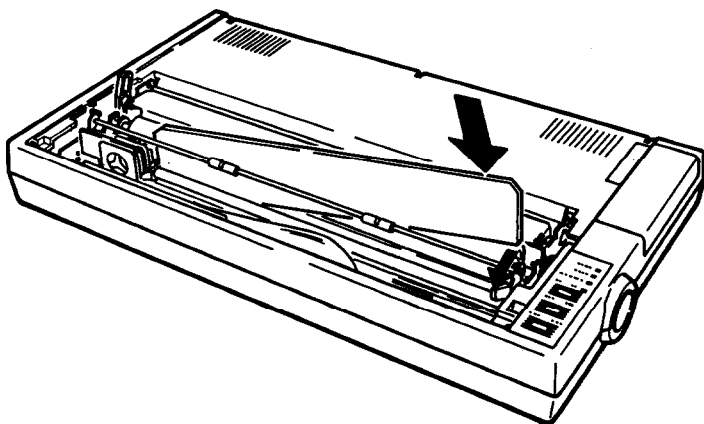
If you need to transport your printer some distance, carefully repack the printer using the original box and packaging materials, as described below.

1. Turn off the printer.
2. Remove the tractor cover, paper guide, and paper rest.
3. Unplug the power cable from the electrical outlet; then disconnect the interface cable from the printer.
4. Remove the ribbon cartridge and paper feed knob.
5. Slide the print head to the middle; then holding the print head in place attach the print head protector.

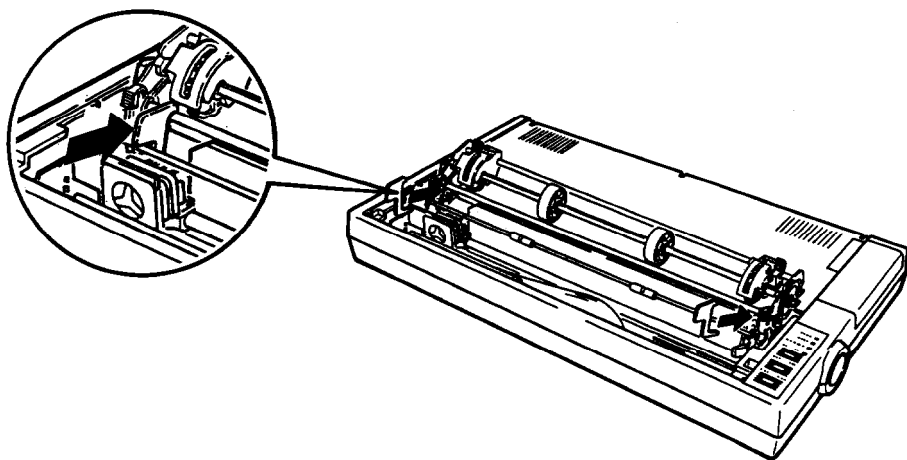


Transporting the Printer

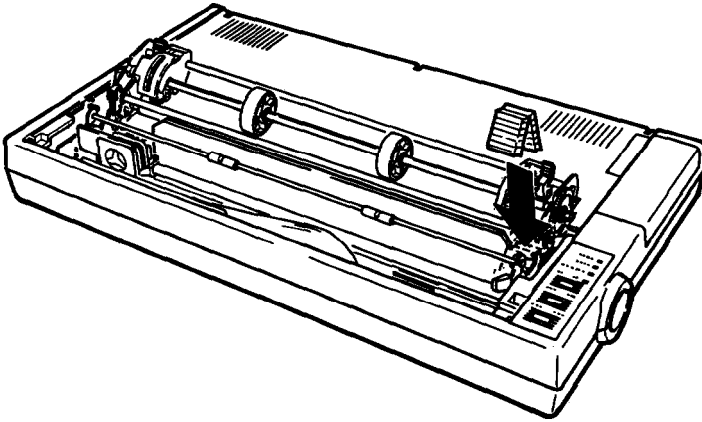
6. Pull the paper bail lever forward; then insert the carriage protector between the paper bail and platen.



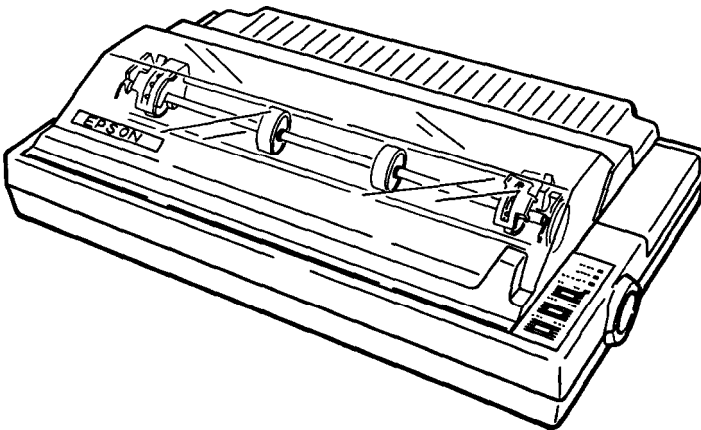
7. Attach the two locking tabs.



8. Attach the platen protector.



9. Reattach the tractor cover.



Chapter 5

Technical Specifications

Printer Specificataions.. 5-2

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 Environmental 5-6

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Initialization 5-11

Default Settings 5-12

Printer Specifications

Printing

Printing method: 24-pin impact dot matrix

Printing speed:

Pitch	Quality	Characters/second/line
10	draft	180
10	Letter Quality	60
12	draft	216
12	Letter Quality	72

Printing direction: Bidirectional logic-seeking for text and unidirectional for dot graphics printing and character graphics printing. See page 3-8 for further information.

Line spacing: 1/6 inch, or programmable in increments of 1/180th of an inch

Printable columns:

Character pitch	Maximum printed characters
10 pitch	136
10 pitch double-wide	68
10 pitch condensed	233
12 pitch	163
12 pitch double-wide	81
12 pitch condensed	272
15 pitch	204
15 pitch double-wide	102
Proportional	116 (maximum width character) 272 (minimum width character)

Buffer: 1 Kbyte or 8 Kbytes (DIP switch selectable)

Character fonts:

Font	Available Pitches (characters per inch)
Epson Draft	10, 12, 15
Epson Roman	10, 12, 15, proportional
Epson Sans Serif	10, 12, 15, proportional

Character tables: 96 standard ASCII characters
14 international character sets and a legal set
Epson Extended Graphics character

Paper

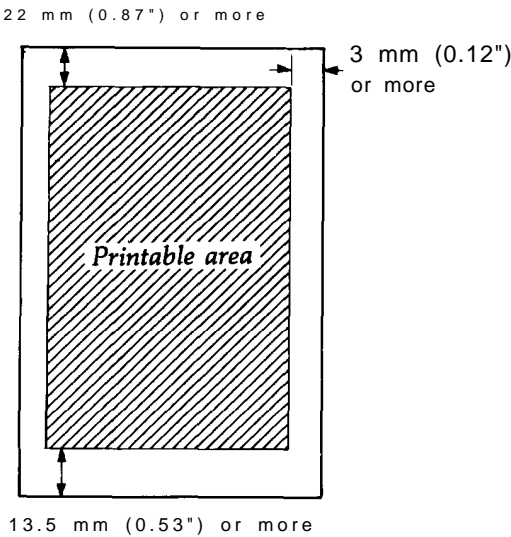
Paper feed methods: Friction
Pull tractor

Paper width: Single sheets
7.2 to 14.4 inches (182 to 364 mm)
Continuous
4.0 to 16.0 inches (101 to 406 mm)

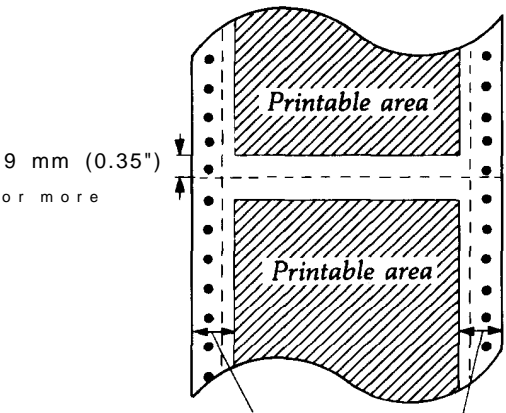
Paper length: Single sheets
7.2 to 14.4 inches (182 to 364 mm)

Printable area:

Single sheet



Continuous paper



***101 to 406 mm (4.0 to 16.0 ") paper width
19 mm (0.75") or more on both sides***

Paper feed speed:	Approx. 100 ms/line at 1/6-inch line spacing with intermittent feeding; 2.2 inches/s with continuous feeding.
Paper thickness:	Single sheets 0.0024 to 0.004 inches (0.06 to 0.10 mm) Continuous 0.0024 to 0.0067 inches (0.06 to 0.17 mm)
Number of copies:	With continuous multi-part paper only; one original plus up to two copies. Maximum thickness: 0.0067 inches (0.17 mm)

Mechanical

Ribbon:	Cartridge ribbon, available in black only (# 7754). Do not use ribbons for 9-pin printers. Life expectancy (in Letter Quality characters, at 48 dots/character): 2 million
MCBF:	For all components excluding print head: 5 million lines
MTBF:	6000 power on hours
Print head life:	200 million strokes per wire
Dimensions and weight:	Height: 3.7 inches (93 mm) Width: 22.9 inches (580.5 mm) Depth: 13.2 inches (335 mm) Weight: Approx. 8 Kg

Printer Specifications

Electrical

Voltage:	120 VAC ±10%
Power consumption:	120 Watts maximum
Frequency:	49.5 to 50.5 Hz (50 Hz version) 59.5 to 60.5 Hz (60 Hz version)
Insulation resistance:	10 MΩ between AC power line and chassis
Dielectric strength: (between AC line and chassis) :	120 V model can withstand 1.25 kV rms applied for one minute

Environmental

Temperature:	Operation: 41°F to 95°F (5°C to 35°C) Storage: -22°F to 140°F (-30°C to 60°C)
Humidity:	Operation: 10% to 80% without condensation Storage: 5% to 85% without condensation
Shock:	Operation: Up to 1 G within 1 ms Storage: Up to 2 G within 1 ms
Vibration:	Operation: Up to 0.25 G at up to 55 Hz Storage: Up to 0.50 G at up to 55 Hz

Interface Specifications

Your printer is equipped with a parallel interface.

Pin assignments for the parallel interface

Connector pin assignments and a description of their respective interface signals are shown in the following table.

Signal Pin	Return Pin	Signal	Direction	Description
1	19	STROBE	IN	STROBE pulse to read data. Pulse width must be more than 0.5 microseconds at the receiving terminal.
2	20	DATA 1	IN	These signals represent information of the 1st to 8th bits of parallel data, respectively. Each signal is at HIGH level when data is logical 1 and LOW when it is logical 0.
3	21	DATA 2	IN	
4	22	DATA 3	IN	
5	23	DATA 4	IN	
6	24	DATA 5	IN	
7	25	DATA 6	IN	
8	26	DATA 7	IN	
9	27	DATA 8	IN	
10	28	ACKNLG	OUT	About an 11 -microsecond pulse. LOW indicates that data has been received and that the printer is ready to accept more data.
11	29	BUSY	OUT	A HIGH signal indicates that the printer cannot receive data. The signal goes HIGH in the following cases: 1) During data entry (ea. char. time) 2) During printing 3) When off line 4) During printer-error state
12	30	PE	OUT	A HIGH signal indicates that the printer is out of paper.

Interface Specifications

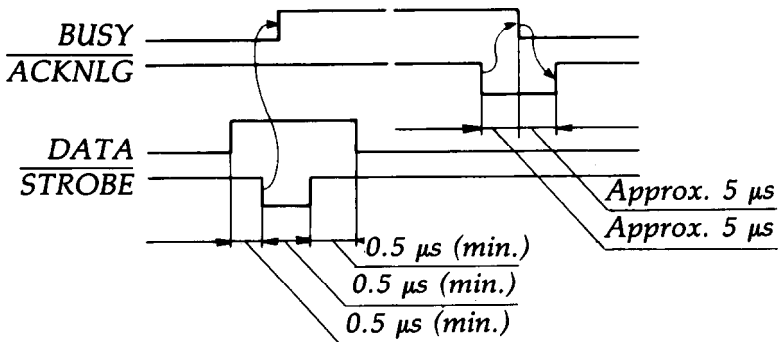
Signal Pin	Return Pin	Signal	Direction	Description
13	—	SLCT	OUT	Pulled up to +5 V through 3.3 K Ω resistance.
14	—	AUTO FEED XT	IN	When this signal is LOW, the paper is automatically fed 1 line after printing. (The signal level can be fixed to this by setting DIP switch 2-4 to ON.)
15	—	NC	—	Unused.
16	—	GND	—	Logic ground level.
17	—	CHASSIS GND	—	Printer's chassis ground, which is isolated from the logic ground.
18	—	NC	—	Unused.
19-30	—	GND	—	Twisted-pair return signal ground level.
31	16	INIT	IN	When this level becomes LOW, the printer controller is reset to its power-up state and the print buffer is cleared. This level is usually HIGH; its pulse width must be more than 50 μ s at the receiving terminal.
32	—	ERROR	OUT	This level becomes LOW when the printer is: 1) in paper out state. 2) off line. 3) in error state.
33	—	GND	—	Same as for Pins 19-30.
34	—	NC	—	Unused.
35	—	—	OUT	Pulled up to +5 V through 3.3 K Ω resistance.
36	—	SLCT IN	IN	The DC1/DC3 code is valid only when this signal is HIGH (Internal fixing can be carried out with Jumper J6. The level of this signal is factory-set to LOW.)

Note:

- The column heading “Direction” refers to the direction of signal flow as viewed from the printer.
- “Return” denotes the twisted-pair return, to be connected at signal ground level. For the interface wiring, be sure to use a twisted-pair cable for each signal and to complete the connection on the return side.
- All interface conditions are based on TTL level. Both the rise and the fall times of **each** signal must be less than $0.2\ \mu\text{s}$.
- Data transfer must be carried out by observing the $\overline{\text{ACKNLG}}$ or BUSY signal. (Data transfer to this printer can be carried out only after receipt of the $\overline{\text{ACKNLG}}$ signal or when the level of the BUSY signal is LOW.)

Interface timing

The figure below **shows** the timing for the parallel interface.



Printing enabled/disabled signals and control conditions

The table below shows the relationship between printing being enabled or disabled, the on line/off line status, and the receipt of the data on/off control characters, DC1, or DC3.

ON LINE (Indicator on)	SLCT IN	DC1/DC3 (Data on/off control)	ERROR	BUSY	ACKNLG	Printing (Disabled/enabled)
on line	Low (interface)	DC1/DC3 (no effect)	High	High/Low	Pulsed ea. char.	Enabled (normal cond.)
on line	High	DC1 Recv'd	High	High/Low	Pulsed ea. char.	Enabled
on line	High	DC3 Recv'd	High	High/Low	Pulsed ea. char.	Disabled*
off line	High/Low (no effect)	DC1/DC3 (no effect)	Low	High	Not generated	Disabled

- While printing is disabled, character data is being received and acknowledged so that the printer can look for another DC1 character that will allow it to resume printing.

Initialization

There are two kinds of initialization methods-hardware and software .

Hardware initialization	<ul style="list-style-type: none">• The power is turned on.• An INIT signal at the parallel interface is received.
Software initialization	The ESC @ command is received.

Hardware initialization — When the printer is initialized, the following functions are performed.

1. The printer mechanism is initialized.
2. Input data buffer is cleared.
3. User-defined character set is cleared.
4. Print buffer is cleared.
5. Default values are set.

Software initialization — Printer initialization by the ESC @ command does not perform functions 1, 2, and 3 above. The settings changed by the last control panel operation are reset.

Default Settings

The table below shows the default conditions that become valid when the printer is initialized.

Item	Reset to:
Top of form position	Current paper position
Left and right margins	Cancelled
Line spacing	1/6-inch line spacing
Vertical tab position	Cleared
Horizontal tab positions	Every eight characters
VFU channel	Channel 0
Font selection	Hardware: reset to current DIP switch setting. Software: reset to the current control panel setting.
Character pitch	Reset to current DIP switch setting.
Justification	Left justification
Special printing effects	Cancelled
User-defined character set	Hardware: cleared Software: deselected only
Graphic mode assignment	ESC K = ESC * 0, ESC L = ESC * 1, ESC Y = ESC * 2, ESC Z = ESC * 3

In addition, when the printer is initialized by turning on the power or by an INIT signal, the data buffer is cleared of all text.

Command Summary

This summary contains all the commands used by the printer. If a command has no parameters, it is merely listed. If it has parameters, they are explained. The parameters are indicated by lowercase italicized letters, usually *n*. The examples below show how the parameters are indicated.

ESC @ is a command with no parameters.

ESC U l/0 is a command that uses 1 to turn the feature on and 0 to turn it off.

ESC \$ n1 n2 is a command with two parameters.

ESC D nn is a command with a variable number of parameters.

ASCII	Dec.	Hex.	Description
Printer Operation			
ESC @	64	40	Initialize Printer
DC1	17	11	Select Printer
DC3	19	13	Deselect Printer
DEL	127	7F	Delete Character
ESC <	60	3C	Select Unidirectional Mode (one line)
ESC U l/0	85	55	Turn Unidirectional Mode On/Off
ESC EM n	25	19	Control Cut Sheet Feeder Mode 4: Turns mode on R: Ejects a sheet 0: Turns mode off
ESC=	61	3D	Set MSB to 0
ESC >	62	3E	Set MSB to 1

Command Summary

ASCII	Dec.	Hex.	Description
Printer Operation (continued)			
ESC #	35	23	Cancel MSB Control
BEL	7	07	Beeper
Data Control			
CR	13	0D	Carriage Return
CAN	24	18	Cancel Line
Vertical Motion			
FF	12	0C	Form Feed
ESC C n	67	43	Set Page Length in Lines <i>n</i> = no. of lines (1-127)
ESC C 0 n	67	43	Set Page Length in Inches <i>n</i> = no. of inches (1-22)
ESC N n	78	4E	Set Skip Over Perforation <i>n</i> = no. of lines (1-127)
ESC O	79	4F	Cancel Skip Over Perforation
LF	10	0A	Line Feed
ESC 0	48	30	Select 1/8-inch Line Spacing
ESC 2	50	32	Select 1/6-inch Line Spacing
ESC 3 n	51	33	Set <i>n</i> /180-inch Line Spacing
ESC A n	65	41	Set <i>n</i> /60-inch Line Spacing
ESC J n	74	4A	Perform <i>n</i> /180-inch Line Feed
VT	11	0B	Tab Vertically
ESC B <i>nn</i>	66	42	Set Vertical Tabs Up to 16 tabs; last <i>n</i> should be 0 (1-255)

ASCII	Dec.	Hex.	Description
Vertical Motion			
ESC b <i>nn</i>	98	62	Set Vertical Tabs in Channels Same as ESC B except the first <i>n</i> selects a channel for tabs.
ESC / <i>n</i>	47	2F	Select Vertical Tab Channel <i>n</i> = the vertical tab channel (0-7)
Horizontal Motion			
ESC l <i>n</i>	108	6C	Set Left Margin <i>n</i> = left margin column
ESC Q <i>n</i>	81	51	Set Right Margin <i>n</i> = right margin column
BS	8	08	Backspace
ESC \$ <i>n1 n2</i>	36	24	Set Absolute Print Position Specifies print position from the left margin in 1/60-inch units Total units = <i>n1</i> + (<i>n2</i> x 256)
ESC \ <i>n1 n2</i>	92	5C	Set Relative Print Position Moves current print position in units of 1/120 inch for draft and 1/180 for LQ Total units = <i>n1</i> + (<i>n2</i> x 256)
HT	9	09	Tab Horizontally
ESC D <i>nn</i>	68	44	Set Horizontal Tabs Up to 32 tabs (1-255) entered in ascending order Terminated by 0

Command Summary

ASCII	Dec.	Hex.	Description
Overall Printing Style			
ESC x n	120	78	Select Letter Quality or Draft 1: Letter Quality 0: Draft
ESC k n	107	6B	Select Typestyle Family 0: Roman 1: Sans Serif
ESC ! n	33	21	Master Select To find the value of n add together the numbers of the typestyles you want to combine from the list below: 10 pitch: 0 decimal, 00hex; 12 pitch: 1, 01; proportional: 2, 02; condensed: 4, 04; emphasized: 8, 08; double-strike: 16, 10; double-wide: 32, 20; italics: 64, 40; underline: 128, 80
Print Size and Character Width			
ESCP	80	50	Select 10 CPI
ESC M	77	4D	Select 12 CPI
ESC g	103	67	Select 15 CPI
ESCpl/0	112	70	Turn Proportional Mode On/Off
SI	15	0F	Select Condensed Mode
ESC SI	15	0F	Select Condensed Mode
DC2	18	12	Cancel Condensed Mode
s o	14		Select Double-wide Mode (one line)

ASCII	Dec.	Hex.	Description
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Print Size and Character Width (continued)			
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ESC SO	14	0E	Select Double-wide Mode (one line)
ESC W l/0	87	57	Turn Double-wide Mode On/Off
DC4	20	14	Cancel Double-wide Mode (one line)
ESC w l/0	119	77	Turn Double-high Mode On/Off

Print Enhancement			
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ESC E	69	45	Select Emphasized Mode
ESC F	70	46	Cancel Emphasized Mode
ESC G	71	47	Select Double-strike Mode
ESC H	72	48	Cancel Double-strike Mode
ESC S O	83	53	Select Superscript Mode
ESC S l	83	53	Select Subscript Mode
ESC T	84	54	Cancel Superscript/Subscript Mode
ESC (- nn	40	28	Select Score ESC (- 3 0 1 nl n2 nl = 1: Underline nl = 2: Strikethrough nl = 3: Overscore n2 = 0: Cancel score line selected by n1 n2 = 1: Single continuous line n2 = 2: Double continuous line n2 = 5: Single broken line n2 = 6: Double broken line
ESC-1/0	45	2D	Turn Underline Mode On/Off

Command Summary

ASCII	Dec.	Hex.	Description
Print Enhancement (continued)			
ESC 4	52	34	Select Italic Mode
ESC 5	53	35	Cancel Italic Mode
ESC q n	113	71	Select Character Style 0: Normal style 1: Outline 2: Shadow 3: Outline with shadow
Word Processing			
ESC a n	97	61	Select Justification 0: Left justification 1: Centering 2: Right justification 3: Full justification
ESC SP n	32	20	Set Intercharacter Space <i>n</i> = number of units of space added to the space between characters (1-127) Units are 1/120 inch (draft) and 1/180 inch (LQ and proportional)
Character Tables			
ESC t n	116	74	Select Character Tables Selects character table for codes 128-255 0: Italic 1: Extended Graphics 2: Remaps download characters from O-127 to 128-255

ASCII	Dec.	Hex.	Description
Character Tables (continued)			
ESC R n	82	52	Select an International Character Set 0: USA 1: France 2: Germany 3:UK 4: Denmark 5: Sweden 6: Italy 7: Spain 8: Japan 9: Norway 10): Denmark II 11: Spain II 12: Latin America 13: Korea 64: Legal
User-defined Characters			
ESC & n n	38	26	Define User-defined Characters ESC & 0 n1 n2 d0 dl d2 data n1 = code for first character; n2 = code for last character; d0 = left space of character; dl = body width of character; d2 = right space of character data: 3 bytes required for each column; super/subscripts require only 2 bytes per column
ESC : 0 n 0	58	3A	Copy ROM to RAM n = font family 0: Roman 1: Sans Serif
ESC % n	37	25	Select User-defined Set 0: Normal set 1: User-defined set
ESC 6	54	36	Enable Printable Characters With Extended Graphics this command enables the printing of codes 128-159
ESC 7	55	37	Enable Upper Control Codes Cancels ESC 6

Command Summary

ASCII	Dec.	Hex.	Description
Graphics			

ESC K n1 n2 75 4B Select Single-density Graphics Mode

ESC L **n1 n2** 76 4C Select Double-density Graphics Mode

ESC Y n1 n2 89 59 Select High-speed Double-density

ESC Z n1 122 90 5A Select Quadruple-density Graphics

ESC K,L,Y, and Z each select an 8-pin mode

Total columns = n1 + (**n2 x 256**)

ESC * **m n1** n2 42 2A Select Graphics Mode

Total columns = n1 + (n2 x 256)

Option	Pins	m	Horiz. dots/inch
Single-density	8	0	60
Double-density	8	1	120
High-speed double-density*	8	2	120
Quadruple-density*	8	3	240
CRT I	8	4	40
CRT II	8	6	90
Single-density	24	32	60
Double-density	24	33	120
CRT III	24	38	90
Triple-density	24	39	180
Hex-density*	24	40	360

ESC ? s m 63 3F Reassign Graphics Mode

s=K,L,Y,orZ

m = mode (0-6)

Appendix

The Interface Boards	A-2
Compatible interfaces	A-2
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The Interface Boards

A number of optional interfaces are available in case your computer does not have a parallel interface or you wish to increase the memory capacity of your printer's buffer.

Compatible interfaces

The Epson interfaces that are compatible with your printer are listed below.

Interface number	Name
# 8143	New serial interface board
# 8148	Intelligent serial interface board
# 8165	intelligent IEEE-488 interface board

If you are unsure whether you need an optional interface or would like to know more about interfaces, contact your Epson dealer.

Installing the interface board

The optional interface boards available for your printer are easy to install. The only tool you need is a cross-head (Phillips) screwdriver.

Before installing an optional interface board, follow these steps.

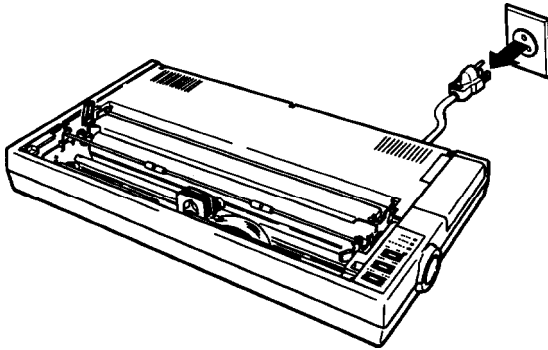
1. Turn off both the printer and your computer.
2. Disconnect the parallel cable from the printer and the computer.
3. Remove the printer cover or tractor cover.
4. Remove the paper guide or paper separator.
5. Remove the ribbon cartridge and paper feed knob.

Removing the upper case

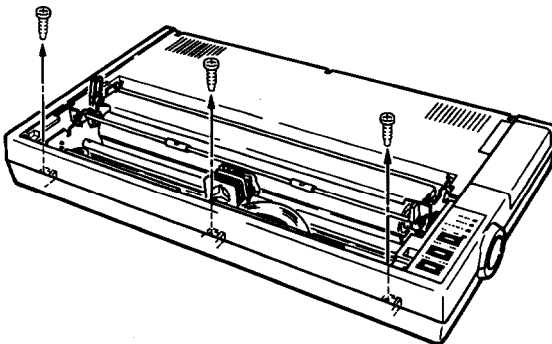


WARNING: High voltages are present inside the printer when the power is on. Do not attempt to remove the upper **case** unless **the** printer is turned off and the power cable is unplugged. Also, try not to touch contacts on the circuit board of the printer because many of the components can be destroyed by the static electricity present in your body.

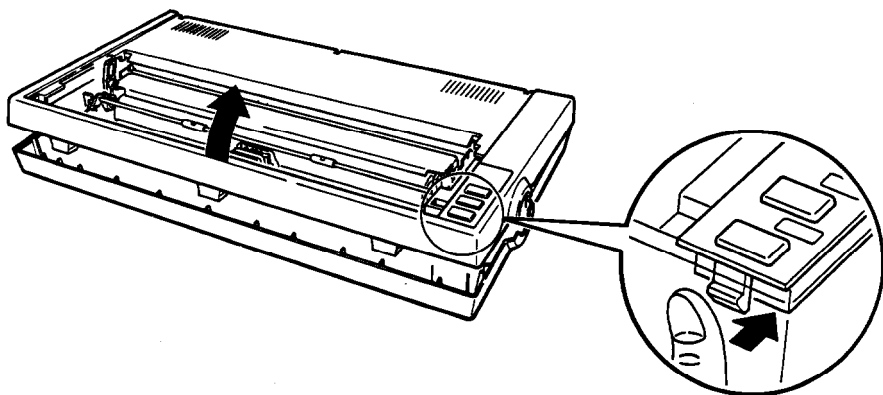
1. Unplug the power cable from the electrical outlet.



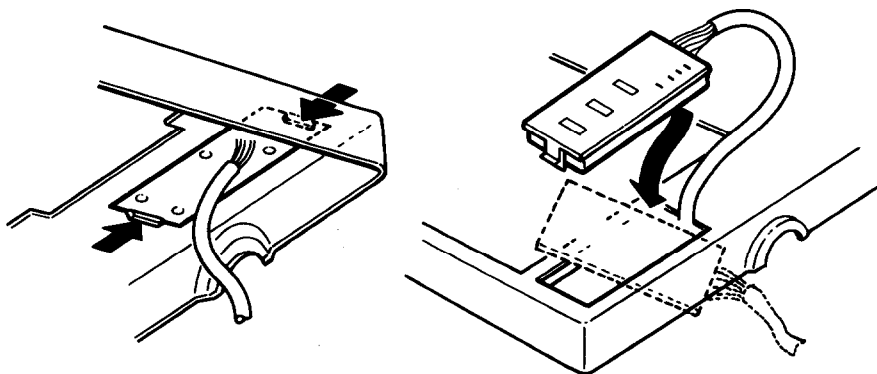
2. Using a cross-head screwdriver, remove the three retaining screws located deep inside of the slots on the front of the printer.



3. Partially raise the upper case, being careful not to strain the cable connected to the control panel. Reach under the case and detach the control panel by squeezing together the two retaining clips.

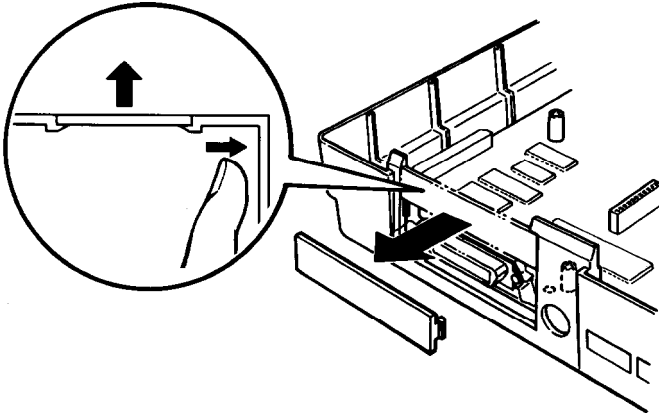


4. Slip the control panel back through the upper case.

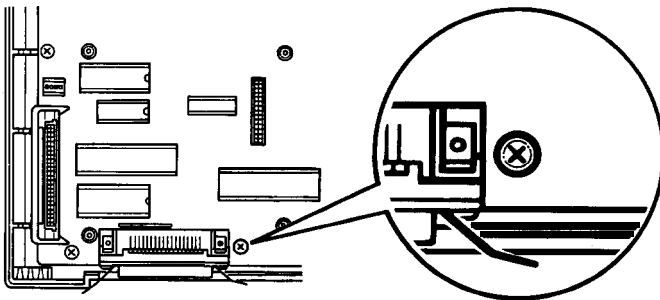


5. Remove the upper case.

6. Detach the shield plate from the back of the lower case. This plate is firmly wedged into place; to remove it gently pull out on the side of the printer case until there is enough of a gap to remove the plate.



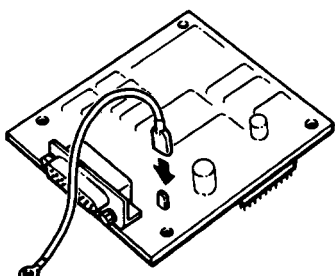
7. Using a cross-head screwdriver, remove the screw labelled CG from the main board. Then set it aside in a safe place.



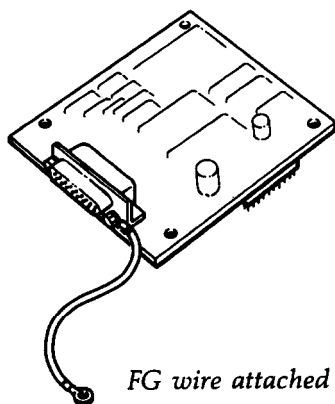
Installing the board

There are two basic types of interface board designs-the frame ground (FG) wire is attached for one type and not attached for the other. This difference does not affect the operation of the interface in any way.

1. If the interface board comes with an FG (frame ground) wire that is not already attached to the board, attach the wire as shown below on the left.

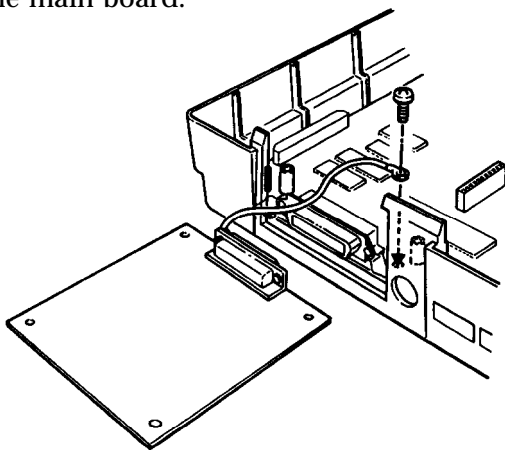


FG wire not attached

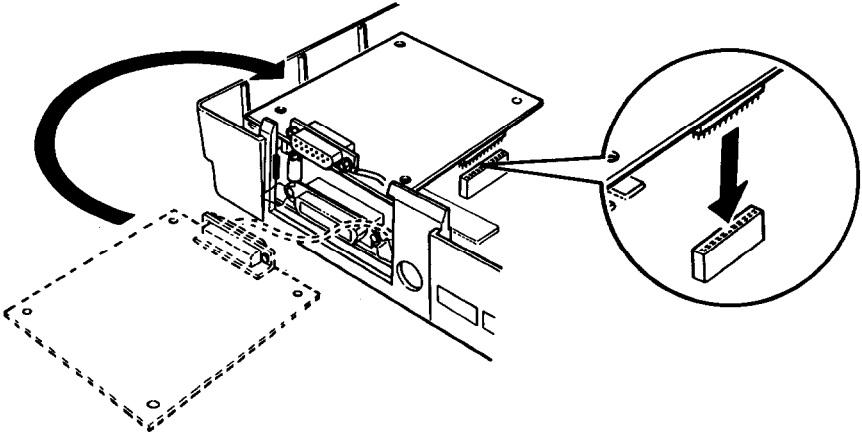


FG wire attached

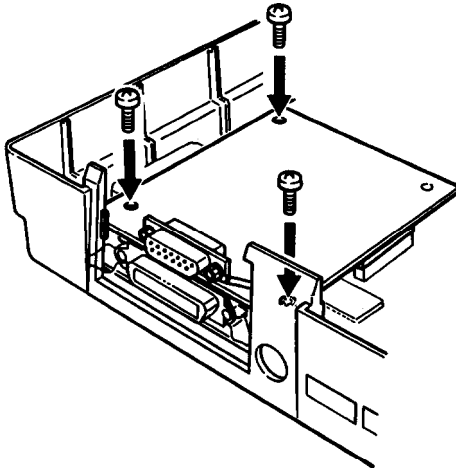
2. Carefully place the interface board next to the printer as shown below. Use the CG screw to connect the round end of the FG wire to the main board.



3. Holding the interface board level, rotate it clockwise into position and attach it to the main board. Be sure that the connector pins are properly inserted into the mating connector.



4. Secure the board with the three screws provided.



The Interface Boards

- 5. For all interface boards except the #8143 New serial interface board, set the DIP switches on the interface board according to the manual accompanying your interface board. (If you have the #8143 board, see the description below.)
- 6. Reattach the upper case in the reverse order of the installation.

#8143 New serial interface board

If you are using an optional interface, you may need to match the communications protocol of the printer and the computer so they can communicate properly. Use the information in your optional interface manual or the computer manual to match the computer with the interface.

For the #8143 optional interface board, use the DIP switch settings shown below. These DIP switches are on the interface board, not on the printer.

#8143 DIP switch settings

DIP SW	Function	ON	OFF
1-1	Selects baud rate	See following table	
1-2	Selects data length	7 bits	8 bits
1-3	Selects baud rate	See following table	
1-4	Selects baud rate	See following table	
1-5	Selects EVEN ODD parity	EVEN	ODD
1-6	Enables/disables parity check	Enabled	Disabled
1-7	Selects baud rate	See following table	
1-8	Enables/disables # 8143 mode	Enabled	Disabled

#8143 baud rate selection

Baud rate	SW1-7	SW1-1	SW1-4	SW1-3
75	ON	ON	ON	ON
110	ON	ON	ON	OFF
134.5	ON	ON	OFF	ON
150	ON	ON	OFF	OFF
200	ON	OFF	ON	ON
300	ON	OFF	ON	OFF
600	ON	OFF	OFF	ON
1200	ON	OFF	OFF	OFF
1800	OFF	ON	ON	ON
2400	OFF	ON	ON	OFF
4800	OFF	ON	OFF	ON
9600	OFF	ON	OFF	OFF
19200	OFF	OFF	ON	ON
19200	OFF	OFF	ON	OFF
19200	OFF	OFF	OFF	ON
19200	OFF	OFF	OFF	OFF

Note: During current loop operation, normal data transfer cannot be guaranteed at a baud rate higher than 1200 bps.

Handshaking timing

Print buffer area	Printer status	Printer output
Vacant area = 256 bytes	Cannot receive input data	Sends X-OFF code or sets DTR flag to "1"
Vacant area = 528 bytes	Can receive input data	Sends X-ON code or resets DTR flag to "0"

Error handling

When a parity error is detected, your printer prints an asterisk (*). All other errors are ignored.

Glossary

Note that these definitions apply specifically to printers.

application program

A program that helps you carry out a particular task, such as word processing or financial planning.

ASCII

American Standard Code for Information Interchange. A standardized coding system for assigning numerical codes to letters and symbols.

baud rate

A measure of the speed of data transmission. Usually equivalent to bits per second.

bidirectional printing

Printing in which the print head goes from left to right only on every other line. On the other lines, it goes from right to left. This increases the speed of printing because the head prints in both directions.

bit

A binary digit (0 or 1), which is the smallest unit of information used by a printer or computer. See also number systems.

byte

A unit of information consisting of eight bits.

condensed

Printing in which each character is approximately 60% of the width of standard characters. Useful for fitting wide tables or spreadsheets onto the paper.

continuous paper

Paper which has sprocket-feed holes on each side, is perforated between pages, and is supplied in a folded stack. Also called fanfold paper.

control code

Besides the codes for printable characters, the ASCII standard also includes 33 other codes which are called control codes. These control codes perform such functions as sounding the beeper and performing a carriage return or line feed.

cut sheet feeder (CSF)

An optional, detachable device which automatically feeds single sheets of paper into the printer.

default

A value or setting that takes effect when the equipment is turned on, reset, or initialized.

DIP switches

Small switches in a printer that control various printer functions and set the default status of the printer when it is turned on or initialized. DIP stands for Dual In-line Package.

dot matrix

A method of printing in which each letter or symbol is formed by a pattern (matrix) of individual dots,

double-high printing

Printing in which each character is twice as high as normal.

double-strike printing

A way of producing bolder characters. Each character is printed twice; the second time, the dots are printed slightly below the original dots. Can only be used in draft mode.

double-wide printing

A print width in which each character is twice as wide as normal characters.

draft

One of two print qualities available on your printer. Draft uses a minimum number of dots per character for high-speed printing. See also Letter Quality.

emphasized printing

A way of producing darker characters. Each character is printed twice, with the second slightly to the right of the first.

Epson Extended Graphics

The Epson Extended Graphics character table contains international accented characters, Greek characters and character graphics for printing lines, corners, and shaded areas.

ESC/P

Abbreviation for Epson Standard Code for Printers. This system of commands gives you software control of your printer from your computer. It is standard for all Epson printers and supported by most application software for personal computers.

font

A font is a style of type designated by a family name.

form feed

A control code and a panel button that advances the paper to the next top of form.

interface

The connection between the computer and the printer. A parallel interface transmits data one character or code at a time, and a serial interface transmits data one bit at a time.

italic

A typestyle in which the characters slant. ***This sentence is italicized.***

Letter Quality (LQ)

One of two print qualities available on your printer. Letter Quality reduces the print speed and increases the number of dots per character to increase the print quality. Draft **uses** a minimum number of dots per character for high-speed printing.

line feed

A control code and a panel button that advances the paper one line space.

on line

When the printer is on line, it is in communication with the computer connected to it.

parallel interface

See interface.

parity

Parity is a method for a computer and printer to check the reliability of data transmission.

pitch

Indicates the number of characters per inch (cpi).

platen

The black roller that provides a backing for the printing.

print quality

Your printer has two types of print quality: draft and Letter Quality. Draft is for high-speed, draft quality jobs; Letter Quality is for final, polished documents.

proportional printing

Printing in which the width of the character varies from character to character. For example, a capital W receives much more space than a lower case i. The result looks more like a typeset book than a typewritten draft.

RAM

Random Access Memory. The portion of the printer's memory used as a buffer and for storing user-defined characters. All data stored in RAM is lost when the printer is turned off.

self test

A method of checking the operation of the printer. When the self test is run, the printer prints out its current DIP switch settings and the characters that are stored in its ROM.

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Command descriptions are not indexed here. For information on a specific command, see Chapter 6.

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This equipment generates and uses radio frequency energy and if not installed and used properly, that is, in strict accordance with the manufacturer's instructions, may cause interference to radio and television reception. It has been type tested and found to comply with the limits for a Class B computing device in accordance with the specifications in Subpart J of Part 15 of FCC rules, which are designed to provide reasonable protection against such interference in a residential installation. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause interference to radio and television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient the receiving antenna
- Relocate the printer with respect to the receiver
- Plug the printer into a different outlet so that the printer and receiver are on different branch circuits.

If necessary, the user should consult the dealer or an experienced radio/television technician for additional suggestions. The user may find the following booklet prepared by the Federal Communications Commission helpful:

"Television Interference Handbook"

This booklet is available from the U.S. Government Printing Office, Washington DC 20402. Stock No. 004-000-00450-7.

WARNING

The connection of a non-shielded equipment interface cable to this equipment will invalidate the FCC Certification of this device and may cause interference levels that exceed the limits established by the FCC for this equipment. If this equipment has more than one interface connector, do not leave cables connected to unused interfaces.

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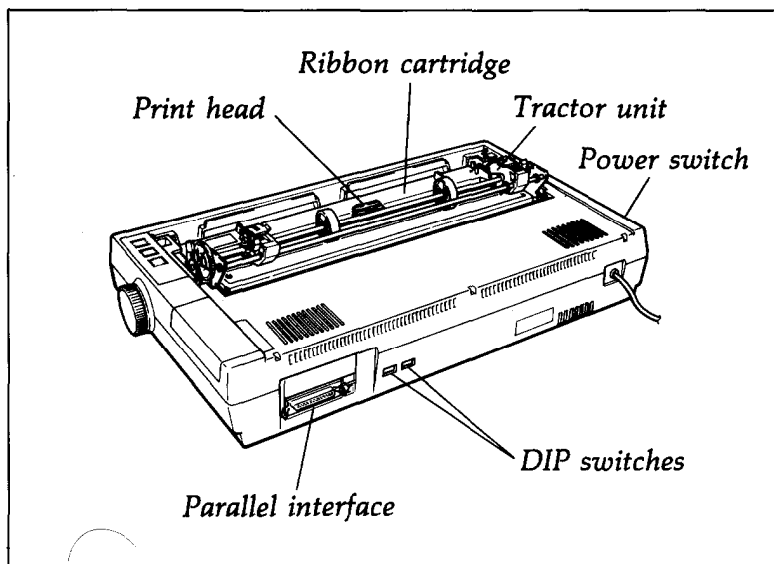
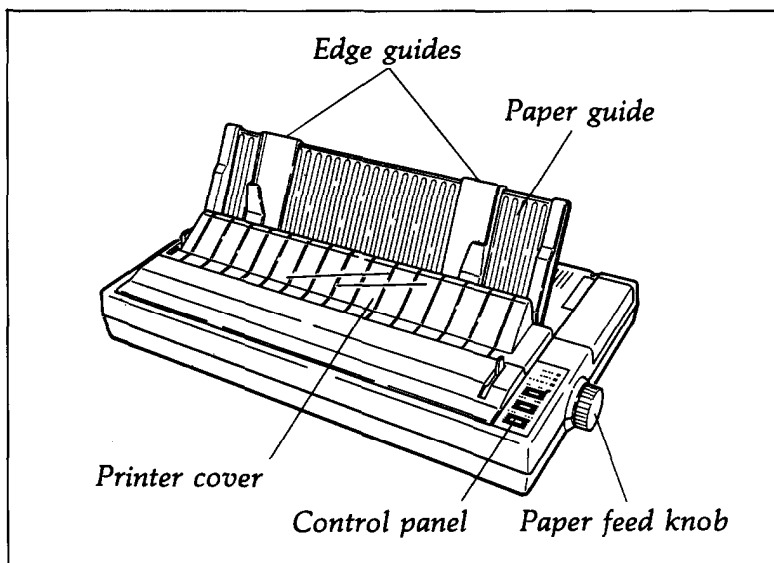
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Quick Reference



USER-DEFINED CHARACTERS/GRAPHICS

ASCII	Dec.	Hex.	Description
ESC & <i>nn</i>	38	26	Define User-defined Characters
ESC : 0 n 0	58	3A	Copy ROM to RAM
ESC % n	37	25	Select User-defined Set
ESC 6	54	36	Enable Printable Characters
ESC 7	55	37	Enable Upper Control Codes
ESC K <i>nl n2</i>	75	4B	Select Single-density Graphics Mode
ESC L <i>n1 n2</i>	76	4C	Select Double-density Graphics Mode
ESC Y <i>n1 n2</i>	a9	59	Select High-speed Double-density
ESC Z <i>n1 n2</i>	90	5A	Select Quadruple-density Graphics
ESC * <i>m nl n2</i>	42	2A	Select Graphics Mode
ESC ? <i>s m</i>	63	3F	Reassign Graphics Mode

DIP SWITCH 1

Switch	Description	ON	OFF
1-1	International character set	See table on page 3-7	
12	" "	"	"
13	" "	"	"
1-4	Font selection	See table on page 3-7	
15	" "	"	"
1-6	Condensed mode	Condensed	Normal
1-7	Character table	Graphic	Italic
i-a	Cut sheet feeder mode	ON	OFF

DIP SWITCH 2

Switch	Description	ON	OFF
2-1	Page length	12 inches	11 inches
2-2	CSF page length	A4 size	Letter size
2-3	Skip over perforation	ON	OFF
2-4	Auto line feed	ON	OFF
2-5	Input buffer capacity	a Kbytes	1 Kbytes
2-6	Print direction for graphics	Bidirectional	Unidirectional
2-7	Character pitch selection	See table on page 3-7	
18	" "	"	"

Commands Arranged by Topic

PRINTER OPERATION/DATA CONTROL			
ASCII	Dec.	Hex.	Description
ESC @	64	40	Initialize Printer
DC1	17	11	Select Printer
DC3	19	13	Deselect Printer
DEL	127	7F	Delete Character
ESC <	60	3C	Select Unidirectional Mode (one line)
ESC U I/O	85	55	Turn Unidirectional Mode On/Off
ESC EM <i>n</i>	25	19	Control Cut Sheet Feeder Mode
ESC =	61	3D	Set MSB to 0
ESC >	62	3E	Set MSB to 1
ESC #	35	23	Cancel MSB Control
BEL	7	07	<i>Beeper</i>
CR	13	0D	Carriage Return
CAN	24	18	Cancel Line

VERTICAL MOTION			
FF	12	0C	Form Feed
ESC C <i>n</i>	67	43	Set Page Length in Lines
ESC C 0 <i>n</i>	67	43	Set Page Length in Inches
ESC N <i>n</i>	78	4E	Set Skip Over Perforation
ESC O	79	4F	Cancel Skip Over Perforation
LF	10	0A	Line Feed
ESC 0	48	30	Select 1/a-inch Line Spacing
ESC 2	50	32	Select 1/6-inch Line Spacing
ESC 3 <i>n</i>	51	33	Set <i>n</i> /180-inch Line Spacing
ESC A <i>n</i>	65	41	Set <i>n</i> /60-inch Line Spacing
ESC J <i>n</i>	74	4A	Perform <i>n</i> /180-inch Line Feed
V T	11	0B	Tab Vertically
ESC B <i>nn</i>	66	42	Set Vertical Tabs
ESC b <i>nn</i>	98	62	Set Vertical Tabs in Channels
ESC / <i>n</i>	47	2F	Select Vertical Tab Channel

WORD PROCESSING/CHARACTER TABLES			
ESC a <i>n</i>	97	61	Select Justification
ESC SP <i>n</i>	32	20	Set Intercharacter Space
ESC t <i>n</i>	116	74	Select Character Tables
ESC R <i>n</i>	a2	52	Select an International Character Set

HORIZONTAL MOTION			
ASCII	Dec.	Hex.	Description
ESC l <i>n</i>	108	6C	Set Left Margin
ESC Q <i>n</i>	81	51	Set Right Margin
BS	8	08	Backspace
ESC \$ <i>n1-n2</i>	36	24	Set Absolute Print Position
ESC \ <i>n1 n2</i>	92	5C	Set Relative Print Position
HT	9	09	Tab Horizontally
ESC D <i>nn</i>	68	44	Set Horizontal Tabs

OVERALL PRINTING STYLE/PRINT SIZE/CHARACTER WIDTH			
ESC x <i>n</i>	120	78	Select Letter Quality or Draft
ESC k <i>n</i>	107	6B	Select Typestyle Family
ESC l <i>n</i>	33	21	Master Select
ESC P	80	50	Select 10 CPI
ESC M	77	4D	Select 12 CPI
ESC q	103	67	Select 15 CPI
ESC p 1/0	112	70	Turn Proportional Mode On/Off
SI	15	0F	Select Condensed Mode
ESC SI	15	0F	Select Condensed Mode
DC2	18	12	Cancel Condensed Mode
s o	14	0E	Select Double-wide Mode (one line)
ESC SO	14	0E	Select Double-wide Mode (one line)
ESC W I/O	87	57	Turn Double-wide Mode On/Off
DC4	20	14	Cancel Double-wide Mode (one line)
ESC w I/O	119	77	Turn Double-high Mode On/Off

PRINT ENHANCEMENT			
ESC E	69	45	Select Emphasized Mode
ESC F	70	46	Cancel Emphasized Mode
ESC G	71	47	Select Double-strike Mode
ESC H	72	48	Cancel Double-strike Mode
ESC S 0	a3	53	Select Superscript Mode
ESC S 1	83	53	Select Subscript Mode
ESC T	a4	54	Cancel Superscript/Subscript Mode
ESC (- <i>nn</i>	40	28	Select Score
ESC-I/O	45	2D	Turn Underline Mode On/Off
ESC 4	52	34	Select Italic Mode
ESC 5	53	35	Cancel Italic Mode
ESC q <i>n</i>	113	71	Select Character Style